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PETROLEUM.

THE DEVELOPMENT OF PETROLEUM AS A SCIENCE.

The recent origin and growth of petroleum is most remarkable. It is not five years since fish oil lamps and tallow candles were the chief dispensers of light throughout all rural districts as well as in many considerable towns. At a period so recent, less than half the light of an ordinary petroleum lamp could only be procured at about four times its present cost. In all the history of progressive science, there is not a single instance of any article of utility being so suddenly and so universally introduced, and becoming at once so indispensable to the comfort and happiness of mankind. Recent as was the discovery of petroleum in considerable quantities, that discovery seems to have anticipated the demand for it. When oil was first found in Venango county, this demand was so limited, that after good wells had commenced producing, they were prevented from flowing, or, if pumping wells, suffered to lie idle or abandoned because there was no market for the oil. At one time the crude would scarcely command ten cents by the barrel, and was not worth the trouble of saving. Incalculable damage was done to producing localities in this way. One of the few common peculiarities among all producing wells, is that they will not suffer neglect. Always extremely capricious in their own conduct, they almost invariably visit anything which borders upon it in their treatment with signal displeasure. The more oil a well yields the more keenly it is alive to mismanagement or stoppage. Small pumping wells are frequently worked by day and allowed to remain idle at night; others have been abandoned for months and then again made to produce in paying quantities; but there are few if any instances where largely producing wells have been designedly, or even accidentally stopped, for more than a brief period, and have afterwards yielded with their former vigor and copiousness. Thus, those wells which were formerly stopped, by plugging or otherwise, have almost without exception resisted all subsequent attempts to renew them, and now make up a considerable catalogue among the *dry holes* of the oil field.

Since 1860 and 1861 the article of Petroleum, then but little known, and less appreciated, has steadily risen higher and higher in public estimation until it now ranks only second to the greatest staple of a great nation. Originating from an obscure county in the interior of Pennsylvania, its tide of wealth has flowed through every State. Its benefits have refused to be confined either by political landmarks, or natural obstacles, and the same artificial light which illuminates our Alleghanian hills by night, sheds its radiance in the labratory of science, the sanctum of the student, and the cottage of the poor, in both the old and new world.

The ramifications of the Petroleum stream extend to every hamlet in America. In Europe these limits are scarcely less confined, while each of the other quarters of the globe respectively demand a larger quantity than sufficed for the wants of the entire human family in 1860. Petroleum is the gift of bounteous nature to her children, and the circle of its usefulness is only circumscribed by the boundaries of civilization.

While this article has been making such enormous strides, both at home and abroad, the method of its discovery and development has been scarcely less active, and from the time it was gathered from the surface of the stream with a blanket until now, the science of developing oil territory, has been rapidly improving. Machinery now does in a few hours what then required days and sometimes weeks to perform, difficulties once deemed insurmountable, are now overcome with ease and rapidity.

Wells were at first dug to the surface rock with the pick and shovel, and a rude board box was then the only substitute for pit pipe. These means answered tolerably when this rock was found near the surface, but when it lay, as at Watson Flats near Titusville, 90 feet below the surface, or, as between Garland and Tidioute, nearly 300 feet down, the same means were inadequate. The boring was then performed with very small drills, and the hole seldom exceeded three inches in diameter. The tools were comparatively defective, and when they happened to become fastened in the well it was generally abandoned and a new hole sunk. These holes are now drilled five, five and a half and even six inches in diameter. The tools are larger, stronger and more perfect, and if fastened by mischance, the increased size of the hole and their superior construction afford so many facilities for extracting them, that cases are extremely rare where wells have to be abandoned on this account.

It is impossible within ordinary limits, to detail all the experiments and improvements that have been made in the various implements for boring and developing wells, and the method of their use. A glance, first at the former, and then at the present manner of accomplishing this must suffice.

When the sight had been selected, generally with but little reference to surface indications, a derrick, which would excite the ridicule of the novice at the present time, was erected over the spot. If no tree chanced to grow near enough, a post was sunk twenty feet or thereabouts from the base of the derrick. To this a sapling (generally a sycamore) was fastened, in a horizontal position, and so arranged that its top reached over the well. This was *the spring pole*. The drill was suspended from it in such a manner that when inactive it hung about fifteen inches from the bottom of the hole. A few feet from the top of the pole, loops or stirrups were attached. A board about five and a half feet from the floor steadied the workmen, while with feet in stirrups, and assisted by the elevating power of the spring pole, they worked the drill up and down, day by day and week by week.

Then, about four feet in twenty-fours was an average day's work. Now it varies from twelve to twenty-five. Wages then varied from twelve to fifteen dollars and board per month, and six men made up the drilling crew of a well.

To the stirrup and spring pole succeeded the horse, and the tread mill and bark grinding process of the tan yard were re-enacted at every well. The use of the waterfall was frequently called in, when practicable, and there are numerous relics of all these antiquated methods scattered throughout the oil field. The Keystone Well on the Cochran Farm was drilled in 1861 with a spring pole. A well in the vicinity of Coopperstown was put down and pumped about the same period by water power, and at about the same time a well in the vicinity of Franklin, was pumped after it commenced producing, by hand power. In pumping, previous to 1861, a common leather-hinged valve was used, and the ball and valve at present almost universal, was then first introduced. The various kinds of "grabs" and other implements used for extracting tools which were lost in wells, were then hardly known, or, if used at all, were so imperfect in their character that it was more common for them to remain down in the well with the fastened tools than to bring the latter up with them. The tubing, the seed bag, the pump and the tanks were generally of a similar character, rudely made, ill-fitted, uncertain in their operation, and always ready to get out of order at the time they were most required. All these in turn have since been the subjects of ingenuity and experience.—Improvement after improvement has followed each other in rapid succession, but the end is not yet, and almost every new well still continues to contribute its quota to this catalogue of improvements. A business which a few years ago was fraught with undue expense and positive uncertainties, has been reduced to a regular system; and an average certainty at limited expense has been obtained.—*Reno Times.*

FISSURES IN SAND ROCK THE RESERVOIRS OF PETROLEUM.

BY R. P. STEVENS.

The paleozic, or sedementary strata, west of the Alleghany mountains, have three important fissures or shrinkage cracks; one generally running with the magnetic lines, or north and south; another at right angles; and the third perpendicular to the above. Besides these there are subordinate ones, crossing the others at various angles; from only a few degrees to forty-five. It is by means of these fissures that the lime stones and slates of the west are so easily removed from their beds in the quarries. The longitudinal fissures will extend to great distances. In the lead bearing limestones of the Black River country I measured one in a due east and west course, across the entire platau, for three-fourths of a mile. On the Alleghany River I have traced them across the valley to quite the same distance, and, in Virginia, one has been traced for many miles.

The perpendicular fissures will often reach through the whole thickness of a particular series of rocks, forming chasms many hundred feet deep.

In the great bed of coarse, pebbly, and fine-grained sandstone forming the base of the coal rocks of Pennsylvania, these after fissures divide the rocks into immense square blocks, with spaces 10, 15, and even 40 feet between.

These fissures in former times were often water channels, and have since become filled with the result of such drainage, viz: cemented sands, pure silex, clays and ores. In this way we account for the iron ores of the tray rocks of Nova Scotia, the veins of jaspar, spar and other minerals in the same rocks; the veins of lead in the Shawangunk mountains, as the Erie and Ellenville lodes, and probably the gold and silver mines of our western States and Territories. When the veins become filled with material, the course of water drainage is changed, and the waters seek some new channel. Lately we have seen in Nova Scotia the central fissure

of the vein filled with mud. This is almost always seen in the lead hematite caves of Missouri and the Galena region. One of these fissures, east and west, in the Alleghany mountains, is thus spoken of by J. P. Lesley, Esq., of Philadelphia:—"There stands this vertical east and west running vein of solid Petroleum, an evidence both of the abundance and antiquity of the Devonian petroleum."

A peculiar feature attending these perpendicular fissures may here be noticed. In their downward extent they will most usually be cut off by the intervention of a stratum of dissimilar nature, or composed of different material. Thus, fissures of limestone will be interrupted by a thin layer of sandstone or sandy shale.—Thus, in the great lead region of the upper Mississippi, sand rock always cuts off the veins of lead.

Another important feature of veins in mountain systems we will also notice.

It has long been established by M. E. Beaumont, of France, and Prof. C. Dana, of our country, that mountain ranges are upheaved along great fissures of the rock strata of the earth, pursuing definite directions according to the age of the upheaval, as, for instance, Alleghanies have a general north-east and south-west direction. In these mountains, all the main fissures will have the same direction, and the veins of iron ore, copper and graphite, will obey the same law, while the subordinate fissures will be at right angles, or north-west and south-east.

In the Shawangunk mountains the course of the mountain is 20° east; the longitudinal fissures have the same direction, while the cross fissures run south 60° east, and north 60° west. The Galena veins of these mountains are in the latter system.

Besides the fissures already mentioned there are innumerable other ones, running horizontally with the strata, and minor cross tracks, due in part to shrinkage, and in part to repeated upheavals and down throws.—These, when viewed separately, seem of minor importance; but, when viewed in the aggregate, become very important in the amount of any fluid they may hold, whether of gas, oil or water.

When we stand by the side of any of the great spouting oil wells of Oil Creek, as, for instance, the Empire in its flowing stage, and see it flowing at the rate of 1,000 barrels of oil per day for many months in succession, we naturally look for the natural reservoir hidden in the rocks below which is capable of holding such an immense quantity of fluid.

To the fissures in the third sand rock must we look for this reservoir. Unfortunately, this rock is hidden 500 feet beneath the surface, at the point of penetration by the bore of the Empire well. It is, therefore, impossible to descend into it; we must reason by analogy, or search for subterranean tanks where this rock comes to the surface. Fortunately, owing to the dip of this, and all contiguous rock to the south, at the rate of about eleven feet to the mile, by travelling northward and ascending the dip, we are enabled to find this sandstone coming to the surface. Accordingly, on French Creek we can see it, cut up by its innumerable fissures—so much that it is difficult to find any very large-sized mass. In similar sand rocks I have measured fissures 10, 12, and 15 inches wide running many rods in linear extent.

The whole of the Devonian series of rocks, wherever seen in chasams, ravines, and river bluffs, is always cut up by the system of fissures already described.—Now, these Devonian rocks are our great receptacles of oil, whether in Canada or the United States. Alluding to the quantity of fluid these cavities can contain, the writer already quoted has so ably stated the subject, we shall continue to quote from him.

"Some of the main fissures are known to be four inches wide. Suppose them of all sizes, from four inches to a quarter of an inch in width, and at various distances, as under from five to fifty feet, and to be limited to the sand rock itself, say thirty feet in height; suppose we take the contents of the fissures to be equal to one five-hundredth of the mass of the rock.—Now, supposing the oil to occupy but one-tenth of the space in each fissure, the remainder being occupied by gas and water, we have a yield of oil to each square mile of sand rock, amounting to 50,000 barrels."

Another source of oil has been demonstrated by excavations in the oil-bearing sand rocks, of Ohio, and this is, the pores of the sand rock itself. The rock is saturated with oil to that degree that from open cuts it oozes out in sufficient quantities to become an economical investment to cut into this solid rock by deep and lateral excavations.

P. Sierry Hunt, of Montreal, has made some experiments testing the capacity of sand rocks to hold water or other fluids. The mean of his results will give seven gallons per minute for thirteen years from one square mile and one hundred feet thick. From a rock as porous as the oil-bearing rocks of Venango County, this quantity should be increased five-fold.

The able author from whom we have already so largely quoted, has also made some calculations on this point of our subject. He says:—"Every foot of gravel rock may be considered to consist of three-fourths quartz, etc., and one-fourth cavity, occupied by water and oil. If we suppose only the uppermost four inches of the whole formation charged with pure oil, that would give an absolute layer of oil one inch thick, underspreading the whole country as far as the sand rock extends, or about 4,000 millions of square inches under every square mile; or, in other words, 17 1-3 millions of gallons, equalling 551,706 barrels.

When we consider that there are several sand rocks thus charged—not less than fourteen, and possibly as many more—extending over many hundred square miles of territory, much of which has yet been unexplored, we may rest in the fullest confidence that petroleum, in its regular supply and permanent quantity, will not fail of becoming one of the most important mining enterprises of our country, as well as one of the most remunerative, to capital judiciously invested and economically expended.

MINING.

ADVANTAGES OF A KNOWLEDGE OF MINERALOGY.

Mr. John Hunt, of Porthleven, read a paper at the Berage Miners' Institution on the benefit likely to result from this and similar Institutions, and the advantage to the working miner and others of knowing mineralogy, &c. Mr. Hunt said:—At the request of your Secretary, I will willingly contribute my mite, hoping that what I am about to say will benefit my young mining friends, and add a little to your praiseworthy institution. Let us first try to picture the difference between a man who spends his leisure hours at your institution, or any similar, and one who spends his time in an ale house, or in any other demoralizing way.—The man desirous of learning, young or old, returns from the institution with more or less added to his knowledge, which he has obtained either by intercourse with his fellow-men, hearing lectures, &c., or by reading books and papers accessible to every member of the institution; and, unquestionably, such a man is benefitted, to use an expression of an old friend, both in mind, body, and estate. Now, the ale-house man—of whom I trust there are none here—returns home after much difficulty, having traversed the road at a great variety of angles, with his brains partly stolen with the "thievish" liquor he has imbibed, and, instead of consoling the poor and, perhaps, almost destitute wife and family, they find the money which ought to have been spent in buying food, &c., has been worse than wasted. The difference between the man desirous to improve his time both for himself and his fellow-creatures and the man who wastes his time by immoral habits, is so great that I should only insult your understanding by attempting to point it out. When your institution gets a little older, I hope you will be able to have a collection of minerals, to which I shall be happy to contribute, so as to instruct the members in mineralogy, which will be found a great advantage to all.—I fancy some of you are ready to say—"I am a tin miner, and know a stone of tin as well as any man in England." Well, suppose you do; are you never likely to work in a mine which produces gold, silver, copper, lead, cobalt, nickel, antimony, or any other ore? Some of you may have an opportunity of bettering your position by going out of the sound of Berage Church bells, and you may work in a mine not only producing the ornary ores of all of the above metals with which you may be acquainted, but do you know all the varieties? Let us presume that you have been a lead miner for many years, and that you worked on the sulphide of what the miners call blue lead, does it follow that you know either the phosphate, carbonate, arseniate sulphate, or any other variety of lead ore? Now, it so happens that, although many experienced men, both as tributers and captains, worked a mine some years since within three miles of this place, containing all the varieties of lead ore before mentioned, it is a question whether the slightest attention was paid to their commercial value, or whether they were known at all, except by a few mineralogists. I once showed a sample of dressed phosphate of lead to a man who was once connected with the mine in question, asking him what he thought of it, and his answer was—"Is it copper or tin? I don't know." Now, one reason why all men connected with mining should be conversant with these minerals is that they are often found in lodes near the surface, where, perhaps, scarcely a particle of the better known sulphide of lead can be found, and as they all probaly proceed from decomposed sulphurets, the advantage of following up lodes producing either the phosphate, arseniate, carbonate, or sulphate of lead, even in small quantities, may lead to the discovery of a rich mine, and, therefore, should be known to every miner. The great variety in which the ores of silver are found renders it advisable also that its different ores should be well studied. I remember some years since being out rabit-shooting with some friends, and near the edge of a cliff a piece of ore was picked up, which was pronounced by a gentleman present who had been engaged in mining, to be iron, and was thrown aside.—

This decision, however, did not satisfy all, and one of the party made a further investigation, and found it to be decomposed sulphide of lead, containing a considerable quantity of silver; indeed, it proved to be the back of a silver lode, and when the mine was worked to a greater depth the lode produced a great quantity of black matter, which the Cornish captain said was maganese, and of which he took but little notice. Now, this black stuff was afterwards found to contain 300 ounces of silver to the ton of ore. If the captain had been acquainted with minerals this blunder had not happened, and no doubt many such instances do occur. Let us suppose that any of you go to Australia or any other place in search of gold; do you not think a knowledge of other ores and precious stones would be of great value to you? Is is not long since that some auriferous sand was sent to my works from Van Dieman's Land, to have the gold extracted, when several sapphires and other precious stones were found with the gold; and I have no doubt the Australasian miner lost many a prize for want of a more extended knowledge of mineralogy. I would here remark that it is most advisable that all men who have an opportunity of learning to assay minerals should do so. I will relate, from personal experience, the advantages derived from knowing how to test the approximate value of ores. An Englishman had some silver-lead works in France, where there was no easy means of obtaining a correct assay of silver-lead ore. On making large experiments on a great quantity of ancient refuse from a mine, he found silver-lead and zinc ores, the latter very much decomposed. The conclusion he came to was that by washing he would be able to concentrate the silver-lead ore, so as to make it of commercial value; but it was found that, although the lead ore was brought by washing up to about 50 per cent. produce, there was very little increase in the product for silver. Care was then taken to assay the heads of the buddles, the middles, and the tails, and there seemed to be about the same (small) quantity of silver in each part.—Knowing, however, that the silver in the unwashed part must be somewhere, the muddy water running off

from the washing was caught, and allowed to precipitate, and there the silver was found, producing from 20 to 60 oz. to the ton of dried muddy water, and also that the principal part of the silver was the result of the decomposed argentiferous blende, which had been deposited there in a fine state some 60 years before with the refuse lead ore from the mine. I make these remarks to show that if the Englishman in question had not been able to assay, instead of making a very profitable affair he might have experienced heavy loss. No refuse from argentiferous ores should be allowed to escape without being tested. Not long since, I washed some very fine black-looking silver-lead ore from South Chiverton Mine. The ore which stood the water contained about 50 per cent of lead and 60 ozs. of silver to the ton of ore, and what washed off and allowed to deposit contained 140 ozs. of silver to the ton, but very little lead, and I feel satisfied that for want of proper attention and careful experiments much valuable mineral of all kinds is lost both at home and abroad. At some future day I hope to read you a short paper on the dressing of ores, &c.—*London Mining Journal.*

SILVER ORES DECREASE IN VALUE ACCORDING TO DEPTH.

Prof. Rowlandson, in an article in the *San Francisco Mining Press*, of Dec 16th, says:—"In proof of the statement made by me years ago, and which I now emphatically repeat, that in silver mines, after passing through the uppermost bonanzas, the ore sensibly decreases in value, may be adduced the returns from the following Nevada mines for the first and last quarters of the current year:—

	March Quarter.			September Quarter.		
	Tons.	Yield.	Value.	Tons.	Yield.	Value.
Gould and Curry,	9,041	$52·78	$477,183	12,289	$34·45	$423,326
Savage,	14,480	42·06	608,819	6,695	39·81	266,544
Chollar,	11,000	40·00	440,000	6,448	36·48	162,219
Potosi,	9,084	33·90	308,120	2,587	40·09	103,721
Ophir,	8,265	25·48	57,712	226	25·23	5,703
Mexican,	60	300·00	18,012	3,653	26·28	96,279
Yellow Jacket,	10,201	33·50	720,107	13,150	38·24	504,213
Belcher,	4,540½	69·05	314,180	7,901	22·87	180,744
Crown Point,	1,043	34·83	36,331	1,267	35·04	44,404
Imperial,	6,997	31·47	201,854	7,189	46·70	335,759
Empire,	3,412	34·94	119,208	4,130	25·00	103,250
Uncle Sam,	150	30·72	4,608	—	—	—
Total,	80,677	$40·97	3,304,964	63,550	$35·12	2,226,562

It will be observed that a few of the mines in the above list exhibit a slight increase in the value of the ore, with respect to which it may be remarked that it will be found generally in such cases that the superior and richer streaks of ore had not yet become exhausted, and also that the bulk of the ores extracted was from inconsiderable depths. In the Gould and Curry, however, it will be remarked that the decline in value amounts to nearly 30 per cent., and although more than one third more weight was raised in the last, in place of the first, quarter, yet that greater quantity was insufficient to replace the loss occasioned by the decadence in quality, the lesser quantity during the first quarter realizing more by $53,000.

ANCIENT MINING.

Miners who work in the Spanish silver mine, known as the "White Pebble Pit," belonging for a long time to the Orfila family, have just made a discovery which is alike interesting to art and archæology. While digging their subterranean walks, they suddenly found themselves in passages whose origin dates from the remotest centuries. They further discovered a thorough and scientific system of mining, the implements being in such a good state of preservation that it could be determined that it was not a Roman, but a Carthaginian or Phœnician mine. The hatchets, sieves for ore, but particularly a smelting furnace and two anvils, excite the interest of engineers in the highest degree. All these articles were carefully collected, and will enable scientific examinations to be prosecuted with greater exactitude than was possible after a merely superficial view. Particular attention will be paid to the remarkable instruments and objects of art which are said to fill the niches of a rotunda in the center of the mine. This rotunda appears to have been the spot dedicated to the gods presiding over mines. It was occupied by three statues—one in sitting posture, and the other two standing, and about three feet in height. These statues remind us neither of Roman nor Grecian art, but rather touch the style of that work of sculpture which was discovered in the year 1852, on the other side of the mountains, and which is now being preserved in the America, at Madrid, and is known as the "Carthagenian Hercules" The same symbols are found on a tripod and on a chest, which were leaning against the sides of the rotunda. Men of science were already excited over the discovery of 1854; the present one will certainly throw a new light upon the study of civilization once very mighty, but now almost extinct. The tools, implements, and objects of art at present form part of the cabinet of M. Lassary, of Valadolid.

PLUMBAGO.—This mineral, which has heretofore ruled quite high in the markets of the world, for the reason that a good quality has heretofore been found in only a few localities on the globe, is now being found in large quantities in various parts of the earth. Large discoveries of this valuable mineral are stated to have been made in the island districts of the Cape of Good Hope. A sample of eight bags has already been shipped to England, in order to test its value in the home market. It is found in various parts of the Eastern States; and a new and extensive deposit is said to have been recently discovered in the town of Richmond, Maine.—Reports pronounce the mine one of the best in the United States. It is also found in quite a number of localities in California. Large quantities, and of a very good quality, are found within eight miles of a good shipping point in Los Angeles County. It occurs in great abundance in Mariposa County, where a new process has recently been adopted for its purification, which it is believed will prove a valuable discovery, and still farther reduce its commercial value.

It is found also and worked at Roger's Rock, Ticonderago, and Fiskill Landing, in Dutchess Co., N. Y., and in Brandon, Vt. A good article is found in Greenville, L. Canada, and lately other localities in Canada East show considerable evidence of it. In Buckingham, near Ottawa City, quite a large district contains it in unusual abundance. Some samples which we have seen are exceedingly fine and pure, both granular and foliated, and a very recent discovery of an extensive vein bids fair to create a sensation if present reports are substantiated.

GAS.

COAL GAS SUPERSEDED.

[From the Builder.—Eng.]

There are innumerable small towns and villages throughout the kingdom which, owing to the difficulty and inconvenience of obtaining and distilling coal, are still without gas, for heating or illuminating purposes, although its advantages are universally appreciated.—The difficulty is now about to be removed, the "Gas-Heat and Pure Light Company" having been projected with a view to erect the necessary works and apparatus (which are very cheap and simple), and to lay mains for supplying gas in places where there is now no gas, and the inhabitants of which are desirous of the accommodation. It is claimed that the heat given out is fitted for application to the most intense metallurgical operations, upon either a large or small scale; and being instantly available by day or night, and entirely under control, it may also be most advantageously used for all domestic purposes. The pure and brilliant light, thoroughly free from sulphurous acid, ammonia, and bisulphide of carbon, is of universal application, and is available in the most isolated positions. It gives no more trouble than ordinary coal gas, and may be had in all situations where the latter cannot be obtained.

According to the invention of Mr. Isham Baggs, to the development of which the company will give the utmost attention, the manufacture of the gases is conducted by the most simple and economical means, and the cost of plant and of working is reduced to a minimum. One large gas-holder and two small ones, with a less number of retorts (for the production of a given quantity of gas) than are generally required constitute the principal outlay. The combustible gases produced under the patents are hydrogen and carbonic oxide, and these are made exclusively from coke by decomposition of water, for though iron is used for effecting this decomposition, it is revivified and restored to the metallic state at every succeeding stage of the manufacture, and so on again and again *ad infinitum*, without waste and without removal from the retort, the hydrogen and carbonic oxide being generated separately, and passed into the same gas-holder for mixture and subsequent consumption; coke, therefore, and water are the only substances really consumed in the process. A ton of coal, in round numbers, will produce in the ordinary gas manufacture an average of 9000 cubic ft., but under these patents the coke is entirely consumed, and produces from only 13 cwts. no less than 40,000 cubic feet of gas. Now, 25 per cent., or one-quarter of the coke obtained—that is to say, about 3¼ cwts. of coke to the ton of coal—is required as fuel for the furnaces under the existing system of gas making.

Allowing even more than double under this system, then 40,000 cubic feet of gas are produced from a consumption of 1 ton of coke—13 cwts. inside and 7 cwts. outside the retorts—it is, however, believed that the consumption will be less than this. Further, the labor of production is less than half that of the present system for a less number of retorts; those containing the iron are almost permanently closed. All processes of purification are done away with, and consequently no nuisances of any kind whatever result from the manufacture. The 40,000 cubic feet of gas above referred to as produced from 1 ton of coke is carbonic oxide exclusively. The quantity of hydrogen gas generated by the combustion of another ton of coke in the second or regenerative stage of the process of manufacture is far greater in volume than 40,000 cubic feet more, so that here again considerable more than 80,000 feet of the two combustible gases are produced from the combustion of every two tons of coke.

As intimately connected with the economical production of these gases under the present patents, it is of the highest importance, in a practical point of view, to consider the relative quantities of heat which they are capable of giving off in combustion when contrasted with coke (carbon). Carbon, hydrogen, and carbonic oxide, in combining with similar weights of oxygen, in the process of burning, give out carbon (coke), 24, 240 units of heat; hydrogen, 34,462 units; and carbonic oxice, 36,876 units. (See Prof. Miller's "Chemistry," vol. I.)

It may also be observed that in all previous patents and experiments for the generation and use of these gases they were invariably obtained in a state of admixture with large volumes of nitrogen from atmospheric air, and other gases, which greatly lower their inflammable and heat-producing power. Under Mr. Bagg's patents the gases are not mixed with nitrogen, but are absolutely pure, and can be burnt with or without an admixture of atmospheric air. But that there may be no subsequent disappointment, it is the joint intention of the promoters of this company, and of their engineer, Mr. Tom. A. Hedley, to construct, in the first instance, works upon a small scale, but yet of sufficient dimensions, to demonstrate the thorough practicability of the invention, and its immediate usefulness as a cheap and available source of intense and controllable heat, applicable to a variety of manufactures and useful purposes, and also eminently suitable as an ordinary medium of brilliant and economical illumination.

A FRENCHMAN has made arrangements to descend to the bottom of the sea in a submarine vessel, and take photograps of submarine objects. He proposes to use electric light.

GOLD YIELD OF OREGON.—The Dallas Mountaineer gives tables showing that the gold yield of Oregon is $6,450,006. The mines of Southern Idaho are not included.

MISCELLANEOUS.

Entered according to Act of Congress, in the year 1866, by J. W. BRYANT, in the Clerk's Office of the District Court of the United States, for the Southern District of New York.

TREATMENT AND USES OF PEAT AND PEATY MATERIAL.

BY J. BURROWS HYDE.

Deposits of Peaty matter abound in the United States. The marsh lands extending along our sea coast and bays, the wet meadows skirting our rivers and streams, all swamps and bog meadows, and such flat grass or moss covered lands as are subject to frequent overflow and saturation by water, whether fresh or salt, or both, usually afford peaty matter varying from a few inches to many feet in depth. It is usually found in wooded districts, even upon hilly land where a depression of the surface permits an accumulation of leaves and other vegetable material, which is there exposed to saturation by water. Indeed it appears to be be distributed in about equal proportions to the area of most of the Northern and Eastern States; even on the barren district of Cape Cod, in the State of Massachusetts, there is a deposit of good fuel peat which has been explored to upwards of forty feet in depth.

In an economical sense peaty material should be divided into two classes —the fibrous and the non-fibrous. Both are often found together in localities where the surface presents a growth of grasses, or mosses, or both; but in that of swamps and wooded districts there is usually an entire absence of fibre. The quality of the material for useful purposes varies greatly whether it be fibrous or not; from causes which will be set forth.

All peats are accumulations of decayed or partially carbonized vegetable matters, and have their origin from no other source. The value of the material for heating, or for generating gas, or as fertalizing agents, depends much upon the nature of the vegetable growth of supply, and the exposure of the bed to adulteration by washings from earthy or mineral matters from adjacent districts.

The fibrous peat results from the decay of plants and roots of grasses and mosses which have grown on the spot. Sending downward their finely threaded roots in felt-like compact masses, each year's growth undergoing partial decomposition or carbonization. The superficial vitality continues, the plant growing on from year to year, while still attached to the slowly accumulating deposit of decayed material below; which finally loses every trace of vegetable delineation, in which condition it is generally known to farmers by the senseless name of "muck." The fibrous portion I consider "peat" proper.

The peaty matter found in swamps and wooded districts being usually the result of decomposed leaves and branches, generally contains more carbon and distillable matter, and less ash than the former kind.—This description is also known by the name of "muck," and like that before described is of a blackish color and butter-like consistency when cut from the bed. Usually when first cut it has an acid odor and taste. When dried in masses it is of a dark brown or umber color, varying however to quite black, and frequently when first dried is covered with a whitish efflorescence or mould-like presentation. Dried, it varies in specific gravity and compactness, and when cut with a sharp knife shows a vitrious lustre. Neither color, weight, nor solidity can be taken as an indication of its richness; this depends upon the character of the original vegetable matter, and from transported material mixed with the peat.

When the deposit is adjacent to, or bordered by, higher ground, or in the vicinity of exposed soil or sand, wind and rains carry this foreign material on to the bed. And also where the bed is subject to the overflow of adjacent streams, earthy matter is by that means transported to and deposited upon the mass; either of which causes of adulteration in the course of years seriously depreciates the value of the peat. If the saturating water holds lime or other mineral matter in solution, those solids will, to a considerable extent, be precipitated, and also have an impoverishing effect.

A simple, and for most useful purposes, efficient way for testing peaty matter is as follows:—Break the peat into small pieces, say the size of grains of wheat, and expose it to the sun's rays upon a seasoned board, or upon earthen ware, and when dry enough to do so, pound it fine in a common mortar, and expose as before to the sun. When it is as dry as this means will effect, weigh an ounce or more with care; place this in a shallow vessel of iron or other convenient material which put into a hot fire. At first a considerable volume of steam will arise. This is due to the hygrometric nature of the peat, which holds from 25 to 35 per cent. of its weight in moisture that cannot be expelled by solar heat. Apply a lighted taper to this vapor, for as soon as the water is expelled carburetted hydrogen gas will succeed it; this will burn several minutes, leaving charcoal. Now patiently and gently blow this mass, stirring it constantly with a piece of clean iron (an old pipe stem will be better) until every spark of the coal shall have disappeared, taking care that the fire is kept very hot. Now remove the vessel, and when cold carefully collect and weigh the "ashes," and the proportion of that weight to the first will give its value for heating purposes. I have tested peat which gave only five per cent. of ash, which was unusually fine. Not long since, a friend who was negotiating for the purchase of peat property sent me a sample of what had been pronounced most superior quality. It was compact, heavy, dark color inclining rather to dull black than brownish. I placed a piece upon a common coal fire. It gave off little gas, and when thoroughly burned retained its original shape, and nearly the same size, and in such tenacity as not to break on being removed from the fire; this weighed 75 per cent. of its original weight, and of course was worthless.

The bottom of peat beds are usually hard and firm, sometimes sand or gravel or both, but often a fine, clay-like substance, which varies in color in different localities—light grayish white to dark gray, and light brownish white to dark brown. I once took from a deposit (of the former color, which was several inches in thickness) a sample, which I found to be a superior polishing powder, and which, under the microscope, proved to be composed of the remains of insect life, it being made up of the infusorial shields of animalculæ —little shells. It was a most superior quality of novaculi, or "rotten stone," and generally the fine, clay-like material found under such circumstances will prove to be of a similar character.

In determining the quality and value of peaty deposits, the following is a simple method—the extent of the bed and convenience of access being considered, and the time dryish weather in summer:—Sound the bed in various parts with a rigid rod of wood, measuring and recording each trial. If the depth exceed two or three feet below the first roots of the plants, all below such depth will usually be non-fibrous, or nearly so. Take samples at intervals of two or three feet from top to bottom of the bed, and determine your warrant for further action by testing the quality as above directed.

In working a peat deposit, the first point is to decide upon the method of drainage. If by trenching you can draw the water to a lower level within reasonable distance, that should surely be done. Stake off transverse lines for drains three or four feet wide, and say twenty feet apart each way, one set leading to a main drain at the side of the bed. Select a surface for depositing the peat by the side of the bed, if convenient, and if possible, where the ground is sloping to let off rain water. From this ground clear off all shrubs, stones, and long grass. If you think proper to erect shelter roofs over this dumping ground, this should be done before proceeding to work. Now, clear off the surface material along between the drain stakes down to the compact peat.

Provide wheel-barrows with flat bottoms thirty inches wide and four feet long; also boards one inch thick and one foot wide, for barrow tracks; and spades with blades eighteen inches long and six inches wide, with a flanch turned up at right angles on the right-hand side, three inches high, and same length as the blade. This determines the size of the blocks; cut from the bed from left to right and as nearly vertical as convenient, each cut being deposited on the barrow, by which it is removed to the dumping ground, where it should be piled up in such a way as to allow the air to circulate among the mass for drying; the fibrous being kept distinct from the non-fibrous.

Peat dries very slowly; the surface dries and shrinks, closing, or nearly closing the pores of the dried portion, and while enveloping internal moisture, externally it appears quite dry. Hence when partially dry it is best to break the mass through the center longitudinally, and expose again. Drying peat for fuel by artificial heat I consider in an economical sense, an impossibility unless competing fuels are sold at higher prices than they have hitherto cost in this country.

Thoroughly air-dried peat, even in small particles, contains as before stated, a large per cent. of water. I have pulverized peat of a fine quality to an impalpable powder, exposed it spread in a thin layer to the sun, weighed carefully a quantity and placed it in an oven at 200° heat; then weighed it again and found it had lost one-fourth of its weight; placed it again in the air on a dry day, and in a few hours it recovered its original weight by absorption from the air; and this it will always do When peat has been thoroughly air-dried and afterwards exposed to the rain, the surface pores being sealed up, as before stated, it will not again become wet below the surface except to small fragments. But when exposed to frost, it will (except when compressed by mechanical means) disintegrate into powder from the expansion of the containing moisture.

Compressed peat, for heating purposes, has infinite advantages over the non pressed peat, embracing tenacity for handling and transportion, reduced bulk, and great economy in combustion. Besides, I have no doubt some qualities of peat may be useful when compressed which in a crude state is not worth transportation. Various machines and processes have been patented in Europe, and some few in this country, for treating peat for fuel, consisting first in those for separating the fine portion from the fibrous; and secondly for compressing the fine material into convenient solid shapes. From a personal examination of the various systems, I believe the most successful method yet devised is of American origin. The essentials of this class of manipulations are, the greatest possible condensation of the peat at the least possible cost; and I entertain no doubt that this long neglected and abundant material, so convenient and accessible to almost every district in the manufacturing States, is in future to occupy a prominent rank as a fuel whatever may be the cost of other heating mediums. Besides, peat has many other valuable uses, which I shall hereinafter set forth.

The fine portion of peaty matter, whether it result from grasses, mosses, leaves or wood, bears such a close resemblance, to the eye, whether taken from a meadow on the sea shore, or a slough in the forest, is popularly called "muck." It should be known by a more appropriate name, particularly as this name has many other significations.

There is a material of vegetable origin well known to chemists, called *Ulmin*, and which has some peculiar properties. I find this fine peaty matter of good quality responds to all the chemical tests of Ulmin. There can be no doubt this would be a more appropriate name for the article, although I have never found it so called either in Europe or this country; and yet the acid of peaty deposits has to a great extent been called ulmic acid. Hence it seems better to say ulmin beds, ulmin deposits, ulmin fuel, etc. I shall therefore use this word, and refer only to the useful or fine portion of such material in its economical adaptabilities.

It is upwards of twenty years since in several parts of Europe my investigations satisfied me that the day would come when this commodity would receive its proper employment in this country. Some of the finest iron ever made in Germany was smelted by peat fuel,

years ago; and yet it is but a few years since, even in England, it ranked for any other value than to give scanty warmth around the hearth of the most humble cottager. The discovery of its greater scope of usefulness gave rise to exalted speculations, even in Parliament, where distinguished political economists speculated Ireland into a mine of wealth; which led to statutes chartering companies with fabulous capitals, which, however, were wasted in making sterine candles, acetic acid lubricating oils, and such other uses requiring nice and expensive chemical apparatus and careful manipulation, where those products were obtained at ruinous cost, while the true economy of the material was overlooked altogether. Costly and complex machinery was also made for treating and pressing peat, which likewise failed, because too slow and tedious in action. Those failures, from their great notoriety, doubtless retarded for years legitimate enterprises for the uses and treating of peat in Great Britain. Now they have taken up the matter with increased interest and more practical action, confining their applications to heating uses.

Peat usually contains a per centage of ammonia, and often a trace of sulphuret of iron, but so slight a degree of sulphur as to render it one of the least injurious and most cleanly of all fuels for generating steam. The essential requirements as a fuel (quality being satisfactory) are cost to consumers as compared with other fuels, and cost to producers—the last being first and the first last.

In concluding the present paper I entertain no doubt that at all times and seasons, ulmin fuel may be used advantageously, if properly prepared, as compared with other fuels. And this may be detrmined at any time (with necessary furnaces) by weighing equal quantities of different fuels as commercially sold, and evaporating water therewith, taking care always that heat be not wasted by unnecessary openings in the flues.

To be resumed.

☞ Experiments made on the Central railroad demonstrate that peat may be used in running locomotives.

NEW YORK, Mar. 15, 1866.

	Bid.	Asked		Bid.	Asked
Copper Stock.			***Gold Stock.***		
Aztec	7		Benton	1	1¼
Bedford	1	1	Consol'd Gregory		28¾
Boston	4½	5	Corydon	—	3
Caledonia, A. P.	10	12	Gunnel	3¾	4¼
Canada	3¾	4	Great Western	—	8
Carp Lake	3	5	Hope	—	9
Central	—	—	Isaac's Harbor	¾	⅞
Columbian	—	24	Manhattan	—	9
Copper Falls		—	Mariposa	44	44¾
Clifton	—	81	Montana	¾	1
Dacotah	—	5½	New York	2½	3
Derby	½	1½	N. Y. & Nova Scotia	½	1¼
Douglass	—	—	Quartz Hill	9¾	10
Evergreen	18¾	20	Quicksilver M'g Co	81	82
Flint Steel River	12	18½	Rocky Mountain	—	10½
Frue	2¾	5	Smith & Parmelee	7	12
Grand Portage	—	—			
Hancock	12¾	14	***Coal Stocks.***		
Hamilton	—	6	American	98	100
Hilton	5	6	Ashburton	—	25
Hudson	1	2	Central	62	65
Huron	32	33	Cumberland	61	62
Indiana	8¾	9¼	Del & Hud. Canal	206	208
Isle Royale			*Hampshire & Balt.	104	110
Keweenaw	—	6	Pennsylvania	213	215
Knowlton	7	10			
Lafayette	1	2	***Lead Stocks.***		
Manhattan	—	—	Bucks County	¾	⅞
Mendota	—	—	Clute	1¾	1¾
Merrimac	4¾	5¾	Erie	—	20
Minnesota	33	37	Macomb	3¾	4¼
New York, A. P.	2	3¾	Plancentia Bay	1¼	1¾
N. J. Consolidated	4	4¾	Sussex	¾	⅞
Norwich	—	6	Wallkill	3¾	6
Ogima	5	6¾			
Ontonagon	3	4¼	***Iron Stocks.***		
Penn	—	11¾	Copake	8	10
Providence	1¾		French Creek	¾	1
Quincy	96¾		Teal Lake	4½	6
Reliance	1¾				
Rockland	12¾		***Miscellaneous.***		
Superior	8¾		Rutland Marble	17	20
Sharon Consolidated	—		* *Ex. div.*		

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For Elizabeth, 6, 7, 8 10, and 10 a. m.; 1, 2, 3.20, 3.40, 4,10, 4.30, 5, 5,10, 5.40, 6.10, 7.10, 8 20, 10 and 12 p. m.

For Rahway, 7, and 10 a. m. and 12, 2, 3.20, 4.10, 5.10, 5.40, 7.10, and 12 p. m.

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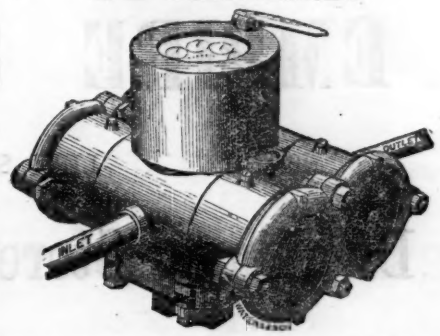

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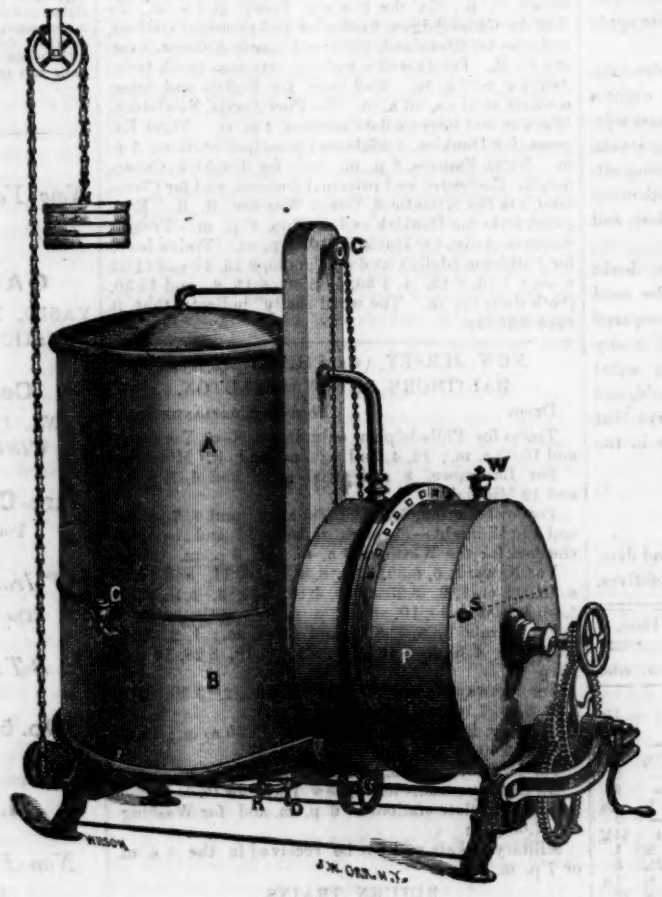

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BROOKLYN CLAY RETORT,

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Philadelphia Fire Brick Works,

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CHEAPER THAN COAL OR WOOD.

The "EAGLE" Gas Heating

STOVES,

Positively guaranteed free from Smoke or Smell.

Will Heat Offices, Parlors, Dining, Sleeping, and Bat Rooms. Also,

The EAGLE Gas Cooking

STOVES & RANGES,

Will BOIL, BROIL, ROAST, BAKE, TOAST,

STEW, and HEAT IRONS

The EAGLE GAS STOVES and RANGES have been in use for over Three years, and are found to be the most SIMPLE, COMPLETE and PERFECT Arrangment for HEATING and COOKING, in every respect ever invented, and to do the Work with LESS TROUBLE, in LESS TIME and at LESS EXPENSE than any Coal or Wood stove.

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☞The Company have descriptive Catalogues, which will be sent or delivered, upon application for them.

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The Mining and Petroleum Standard

AND

AMERICAN GAS-LIGHT JOURNAL,

PUBLISHED ON 2D AND 16TH OF EVERY MONTH.

JAMES W. BRYANT, M. P. CALLENDER, } EDITORS.

FRIDAY, MARCH 16, 1866.

THE MINING & PETROLEUM STANDARD AND AMERICAN GAS-LIGHT JOURNAL, is published at Tribune Buildings, No. 1 Spruce St. on the 2d and 16th of every month, and is a recognized official organ of—

LIGHT, HEAT, MINING INTERESTS.

PETROLEUM, WATER-SUPPLY, AND

SCIENTIFIC SUBJECTS GENERALLY.

JAMES W. BRYANT, PROPRIETOR.

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☞ *Private Office, No.* 111 *Pearl street.*

☞ Our subscribers would confer a favor upon us by remitting *checks, or Post Office Money orders*, as we are frequent losers by money sent by mail.

☞ We should be pleased to make our journal an organ of intelligent discussion for those of our subscribers and readers who may wish to gain, or give information on the subjects to which our columns are devoted. We solicit letters from those who make the study of gas a pleasure as well as a profession.

PEAT AS A FUEL.

We have for some time been intending to give to the subject of Peat the attention, through our journal, which it has seemed to demand, owing to the increasing interest of the public in this really very valuable article. Peat as a fuel, is destined, we apprehend, in a great measure to supersede coal, inasmuch as it is to be found in abundance in almost every section of the country, is easily prepared, and when properly so, is equal, and in some respects superior, to coal, and can be furnished at a cost far below that of the latter article. In pursuance of our intention, we publish in the present number a very valuable paper on this subject by J. BURROWS HYDE, Esq., whose experience and facilities for observation render him competent to treat it in a manner which will be found interesting to all. The present paper will be followed by another from Mr. HYDE equally interesting to the general reader and perhaps more valuable to those who would apply the information there given to practical use. We shall hereafter give the subject the attention it deserves.

☞ The attention of gas companies or others desiring the services of a practical gas manufacturer and gas-fitter is directed to the advertisement of Geo. Coles, in this number.

CURIOSITIES OF THE OIL REGION.

Among the many curiosities of the oil region, none are more marvelous than the springing up and rapid growth of cities and villages in hitherto isolated and almost unsettled sections. A case in point is the town of Reno, Venango County, originally purchased by Hon. CHARLES VERNON CULVER, present Member of Congress from that District, and now the property of the Reno Oil and Land Co.

We, who are familiar with the almost fabulous increase in wealth and population of localities in the oil regions, are surprised at the activity and energy here displayed, as evidenced and set forth in the columns of the *Reno Times*—and which, by the way, in appearance, quantity and quality of matter, and general make up puts to the blush a majority of the weekly newspapers in the country.

The founders of the town have shown excellent judgment in their provisions for the future growth of the place, and welfare and government of its people, from which we cite the following:—In laying out the streets and lots permanent grades are established, and as fast as streets are opened they are graded and macadamized so as to equal Broadway in utility and durability; no lots are sold unless for improvement, each contract specifying the nature of the improvement; no wells will be bored within the limits of the town; the refineries will be erected beyond the local limits, where they cannot be objectionable; Parks have been designed; lots for churches and public buildings have been set apart; a public school of high grade will be endowed by Mr. Culver; and still more important, by the terms of contract for either the sale or lease of lots the purchasers or lessees are prohibited from selling or permitting the sale of intoxicating liquors as a beverage on the premises, and a violation of this clause works a forfeiture of the ownership or occupancy of the same. It is already an important point on the Atlantic and Gt. Western Railroad for receiving and discharging freights and passengers for the oil region, and is destined, we believe, to become the great central commercial town of Northwestern Pennsylvania.

The *Times*, as furnishing statistical and other information in regard to Petroleum, will prove a valuable and welcome addition to our list of exchanges.

MESSRS. EDITORS:—In that useful little manual—"Gas Superintendents' Pocket Companion," page 82, is a tabular statement of the dia. of service pipe for certain distances and number of burners. On comparing this with the more extended table in Clegg, page 314, new ed., I find a wide discrepancy, and would like to be informed which of the two statements is correct. Placing them in parrallel columns the two read thus:

				Companion.	Clegg.
10 Burners	100 feet	from main	....	.750 dia.	.453 dia.
20 "	150 "	"	....	1,250	.649
30 "	200 "	"	....	1.500	.808

Perhaps some explanation can reconcile the two. If they both refer to the same thing, one must be incorrect. G.

Not having at hand the "Pocket Companion" our correspondent refers to, we cannot tell what the calculations he mentions are based upon. Will some of our readers give the desired information?

52,751.—APPARATUS FOR THE MANUFACTURE OF ILLUMINATING GAS.—Tyler Sabatton, New York City:

I claim, 1st, The combination in a gas apparatus of several distillatory retorts with one regenerating retort, substantially as set forth.

2d, The combination of several retorts of a bench with hydraulic main, by means of one dip-pipe fitted with a cup-seal, substantially as set forth.

3d, The combination of the retorts of a bench with a double-chambered superheating retort by pipes, in such manner that the steam to be superheated passes through both chambers of the superheating retort before it passes to a distillatory or decomposing retort, substantially as set forth.

GREAT STRIKE ON BENNEHOFF.

NO. 32 FLOWING 1,000 BBLS. PER DAY.

This well, says the Reno Times of the 8th, promises to be the event of oildom for some time. It is on the Frothingham lease, and the land interest and royalty of one-half are vested in the Bennehoff Run Petroleum Co., and the remaining half in the Hawkins Well Co. On the same lease, an excellent pumping well has been in operation for a considerable time, and is still yielding about 80 barrels per day. On Thursday last, pumping was commenced in No. 32. There proved to be very little water in the well, not more than five barrels being thrown up altogether, when the oil immediately followed. The pumping only continued about ten minutes, when the well began to flow. It was claimed as a good strike of a 300 bbl. well on Friday last. On Saturday it was pumped about half an hour, and on Monday likewise, after which the sucker rods were drawn, when it immediately commenced flowing at an astonishing rate. New wells, especially large ones, are subjects of astonishment rather than measurement, even to the most experienced. Large flowing wells generally produce much more oil during the first rush, than afterwards. It is seldom that an opinion upon the amount a new well is producing is sustained by subsequent facts. Five hundred barrel wells generally turn out but three, and so with other quantities, in smaller proportion. The reader in this instance must be satisfied with opinions of others, upon the quantity of oil actually being yielded, but it is certain that when visited yesterday, it was pouring out at a rate which would have excelled either the United States or Pool Wells of Pithole in their palmiest days. The flow is steady and forcible, spouting from the mouth of the pipe, in a straight line, from five to eight feet, and giving the spectator an impression that it is ejected with great force. The volume of gas is also great. Two board box-pipes, about twenty feet in height, have been erected over the covered tank, into which it flows. From each of these arises a constant volume of gas, so dense and black as to resemble smoke from a chimney. Several gentlemen of much experience in the oil region, visited it yesterday for the first time, and after the usual period spent in discussion and investigation, pronounced it at least "a thousand barrel well."

LIGHTING THE STREETS OF BROOKLYN.

In the Brooklyn Common Council, on Monday night last, bids were received for lighting the streets from sunset until daylight for from one to ten years. The Citizens' Brooklyn, Williamsburgh and Greenpoint Gas Companies agreed to do the work in the districts now lighted by them at the rate of one and ninety-five one-hundredths cents per lamp per hour for one year, and one and seventy-one one-hundredths cents per lamp per hour for the term of ten years. J. E. Leffingwell agreed to do the work, using lamps burning the best refined petroleum, for sixty dollars per lamp per annum, and Francis Swift and R. Furey, using petroleum, at forty-eight dollars per lamp, or two hundred and forty thousand dollars for the entire city. Among the bids were several facetious ones, one of which "proposed to light the city with good looking red-headed girls, thus obviating the use of lamp posts, provided they do not lessen their light by dropping off their water-falls." Another proposal was to light the streets with "three-cent dips or tallow candles."

CURE FOR RHEUMATISM.—The Stockton Independent announces a new cure for rheumatism. It says:—A gentleman of our acquaintance, afflicted with inflammatory rheumatism, made an application of coal oil with a bandage to the part affected, and was cured in the course of a few days.

☞ We have received the annual report of the Directors to the shareholders of the New City Gas Co., of Montreal, for 1865, which, though not so satisfactory as the year before, owing principally to damage sustained at the works by the flood of last spring and suspension of operations for several days in consequence, is as favorable as could be expected, and shows admirable management on the part of the Directors. The accident at Nine Elms, an account of which was published in this journal, has impressed the Directors with the importance of adopting measures of precaution against a similar occurrence at their works, and Professors Dawson and Hunt have made an inspection to ascertain their probable securety, whose report was such as to remove all apprehension. The Directors have also found it expedient to make a further reduction in price of gas. The shareholders have every reason to be satisfied with the report and the results of the year.

COAL GAS SUPERSEDED.

We reprint from *The Builder* an interesting account of a new combination of gases obtained from coke, for heating and illuminating purposes. But it strikes us there is something inconsistent and antagonistic with the science of gases in the statements therein made if full in their details. We can understand how an intense heat is obtained from these gases as explained, but as for their superior illuminating power, to use a vulgar phrase, "we can't see it." However, we are "open to conviction" either from across the water where the system originated, or from our own scientific men.

A NEW FIRE ALARM.

We learn from the *Journal de L' Eclairage du Gaz* that an electrical apparatus is to be tested on board the ship Mersey which appears to offer a guarantee for the safety of the vessel. A dial graduated and furnished with a needle and a bell communicating with twenty conductors of brass wire, which also communicate with as many wires proceeding from calorimeters placed in twenty different sections of the vessel. If the heat in either of these sections becomes sufficiently intense to threaten a fire, the conductor acts upon the electrical battery and puts the bell in motion, and the neddle marks on the dial the number of the section threateded.

The same effect is obtained by similar instruments in detecting water in case of leakage, the cooling of the calorimeter indicating which part of the vessel is occupied by water.

IMPORTANT NOTICE.

To Advertisers.—Our paper offers a snperior medium as an advertising agent, to all those who manufacture or sell machinery or appliances of any kind for Gas, Mining, Water, Sewerage, the production or purification of Oils, &c. &c., not so much on account of a wide-spread circulation, as from the fact that it goes directly to the hands of those who are constantly using and requiring machines and improvements for these branches, and who look through our columns for information where to pro cure them. The class of people who read our paper not only peruse our pages of reading matter, but read the advertisements as well, for the reason that they are directly interested in all things pertaining to their business. We therefore ask, with confidence that we can do them justice, all parties having machinery or improvements of any kind for either of the objects to which our paper is devoted, to send in their advertisements and avail themselves of these advantages. It will be observed that our terms for advertisers are very reasonable.

TO GAS COMPANIES.

WANTED, a situation by a thorough practical man, to superintend or assist in the manufacture of Gas. Was eleven years in his last situation, seven of which he was superintendent. Understands everything connected with the manufacture and distribution of gas from the retort to the burner. Is also a good gas fi.ter. Can furnish best of reference.

Address GEO. COLES.
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Office and Works—Carroll, Piko, Smallman and Wilkins Streets,
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WM. SMITH,

Manufacturer of all kinds of GAS and WATER PIPE, BRANCHES, CONNECTIONS, T's, ELBOWS, and ALL CASTINGS USED AT GAS AND WATER WORKS.

I offer special inducements to parties wishing to purchase, as my Pipe is Smooth, regular in weights, and cast vertically.

N. B.—Pipe from 3-inch and upwards, cast in 12-ft. lengths.

☞ SEND FOR CIRCULAR AND PRICE LIST. ☜
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Every Saturday, the elegant Side-Wheel Steamships
SAN SALVADOR,
Commander, Joshua Atkins, and
SAN JACINTO,
Commander, Winslow Loveland.
Every SATURDAY, from pier 13 North River.

Have been placed on the route to Savannah by the Atlantic Mail Steamship Company of New York, and are intended to be run by them in a manner to meet the first class requirements of the trade.

The cabin accommodations of these ships are not excelled by any Steamers on the coast, and although their carrying capacity is large, their draught of water enables them to insure a passage without detention in the river

San Jacinto, Saturday, March	3	San Salvador, Saturday, Mar.	24
San Salvador, ...	10	San Jacinto, ...	31
San Jacinto, ...	17	San Salvador, ..	April 7

Returning, leave Savannah every Saturday at 3 o'clock, P. M.

Bills of Lading furnished and signed on the Pier.

For further particulars, engagement of Freight or passage, apply to

GARRISON & ALLEN, Agents,
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Corner Hudson and Park Avenues,
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Iron Store Fronts put up at short notice.

Square and Round Columns, Truss Girders, Vault Beams, Window Lintels, Sills. &c.

A large assortment of Railing Castings constantly on hand, or made to order, at the shortest notice.

Lamp Posts—Brooklyn Pattern.

☞ A large stock of the usual sizes of Round Columns kept on hand.

PERCIVAL PATENT STOP-COCK.

WANTED.—An energetic buisness man to introduce this invention. For description and particulars,
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A professional school for the Mechanical, Civil or Mining Engineer, Practical Chemist, Builder and Architect—also provides a general education founded upon the Seiences, Modern Languages and Mental and Political Philosophy. Requisites for admission—Arithmetic, Algebra, Geometery, English Grammar, Geography, and the rudiments of French. Examinations for admission, June 4th, and Sept. 29th. Special students admitted to partial courses without examination. For catalogue, apply to WM. P. ATKINSON, Sec.

SITUATION WANTED

As GAS and STEAM FITTER. Can do some Pluming, Lay Mains and Service Pipe, set, take the state and repair meters, and attend to the mechanical parts of Gas Works. My present engagement expires on the last of March. Have had 16 years' expereince. Good references can be given. Address
JOHN G. GORDON,
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Cooking Apparatus.

All the cooking for a family can be done with Kerosene Oil, with less trouble and at less expense than by any other fuel.

Our stoves give no smoke or odor, and are not liable to get out of order, being as simple in every respect as a kerosene lamp. The Baker, Boiler, and Flat-Iron Heater are the only special articles of furniture required. For all other purposes, ordinary stove furniture may be used.

We would call attention to the fact that for the past three years, the Company has devoted itself almost exclusively to the manufacture of Kerosene Cooking Apparatus, and is prepared to guarantee that every article shall perform all that is claimed for it.

Liberal discounts to the trade. Send for circulars and price list.

KEROSENE LAMP HEATER CO.,

206 Pearl Street,
NEW YORK.

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AMALGAM BELLS

At prices within the reach of every Church, School, Cemetery, Factory, or Farm in the land. Their use throughout the United States and Canadas for the past six years has proven them to combine most valuable qualities. Among which are TONE, STRENGTH, SONOROUSNESS, and DURABILITY OF VIBRATION, unequalled by any other manufacture. Sizes from 15 to 5,000 lbs., costing TWO-THIRDS LESS than other metal, or 25 cents per pound, at which price I warrant them twelve months. Old bell metal taken in exchange, or bought for cash. Send for a circular to the manufacturer,

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List of Academy, Steamboat, Fire-alarm, and Church Bells, with particulars as to Weight, Sizes, Price of Bells, Hangings, etc.

Weight of Bells.	Diameter.	Price of Bells without Hangings.	Price of Patent Hangings.	Price of Bell and Hangings complete.
225 lbs.	26 inches.	$56 00	$15 00	$71 00
275 "	42	69 00	18 00	87 00
375	36	94 00	22 00	116 00
450	84	112 00	25 00	137 00
600	02	150 00	30 00	180 00
750	39	188 00	35 00	225 00
1,000	64	250 00	42 00	292 00
1,200	48	300 00	45 00	345 00
1,400	50	350 00	50 00	400 00
1,600	52	400 00	54 00	454 00
1,800	55	450 00	60 00	510 00
2,000	58	500 00	62 00	562 00
2,500	60	625 00	72 00	697 00
3,000	63	750 00	85 00	835 00
3,500	66	875 00	87 00	962 00
4,000	69	1,000 00	100 00	1,100 00
4,500	72	1,125 00	115 00	1,238 00
5,000	75	1,250 00	125 00	1,375 00

List of Prices, Weights, and Sizes of Farm, Hotel, Steamboat, School-house, Shop, and Factory Bell.

These Bells are fitted with Yoke, Standard's Crank and Bolt, complete for use.

Weight of Bell and Hangings.	Diameter.	Cost of Bell and Hangings complete.
15 lbs.	7 inches.	$3 75
20	8¼	5 00
35	10	8 75
50	12	12 50
75	16	18 75
100	18	25 00
150	20	37 50
200	22	50 00
250	24	62 50

Larger Sizes made to Order at 25 cents per pound.

Guarantee.—All Bells sold at the above prices WARRANTED against breakage by fair ringing, for TWELVE MONTHS from time of purchasing. Should one fail, a new bell will be given by returning the broken one.

Orders may be sent through the AMERICAN ADVERTISING AGENCY, 389 Broadway, New York.

In case a Bell breaks after the expiration of the Warrantee, I allow HALF PRICE for the old metal.

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AN INDESTRUCTIBLE COATING FOR

IRON, TIN, and WOOD.

It consists of seventy-two parts Oxide of Iron, and twenty-eight parts Cement Lime Stone in the one hundred pounds.

It has much more body than red or white lead. It is warranted perfectly water and fire-proof and to withstand a greater heat on metals without scaling, than any other paint in use.

It is a perfect cover for all kinds of iron, tin, or wood-work, out-houses, and canvas coverings. prevents and arrests the corrosion of metals, and is not affected by the action of salt, gases, acids ammonia.

It hardens under water, as has been fully demonstrated by its application to gas-holders, by many of the largest gas companies in the United States; which companies having thoroughly tested its operties as herein claimed, pronounce in its favor over any other paints in the market, even though d at double its price.

As a coating for patterns of iron or wood, when mixed with shellac, it is much superior to beeswax, oil, or shellac alone, as has been proven at the large founderies in the country.

For patching boilers and making joints, it is considered superior to red lead, or any other preparation.

For cleaning metals it takes the place of crocus, ouge, and emery, being better and cheaper.

This Paint requires no more oil than dry lead or zinc, and much less than the ordinary mineral paints. It is free from any waste, and possesses a spreading and covering power unequaled.

Terms, by the Barrel or Half Barrel, Five Cents per Pound.

A liberal discount made to parties purchasing by the ton.

A Barrel or Ton will be forwarded to any gas companies desirous of testing its qualities, for which there will be no charge if it does not give entire satisfaction as being the cheapest and most durable of all other Paints in the market.

Also, Prince's Imperial Black Paint, and Prince's Protoxide of Iron.

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SAVING OF FUEL TO PARTIES USING STEAM.
DAMPER REGULATORS.

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Manufacturers of

PIG IRON & CAST IRON GAS & WATER PIPES.

Also, Heavy & Light Castings of every description, No. 207 North Water street and 206 North Wharves, Philadelphia.

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GAS-HOLDERS,

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And other descriptions of

Iron Work for Gas-Works, Water-Pipes, and Heavy Castings,

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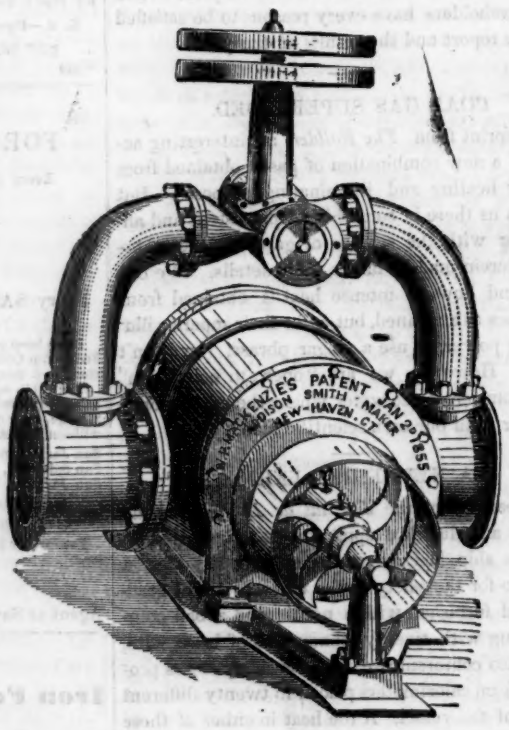
THE MACKENZIE PATENT GAS EXHAUSTER

AND

PATENT COMPENSATOR.



They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the tion and illuminating power of the gas, and add very much to the durability of the retorts, clay or iron. The Compensator obviates entirely the necessity of water-joints, is compact, dur cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

We are also sole proprietors and manufacturers of the

MACKENZIE PATENT BLOWER, PATENT CUPOLA AND SMELTING FURNACE.

The Blower is a Force Blast machine, durably built, and can be driven with one-third the p r equired to drive the ordinary Fan. The Cupolas are manufactured in sizes to melt from 1 ton to 20 ons per hour, will save one quarter of the time required by the old style Cupola, and 33 per cen uel. Address

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ARTESIAN WELL PIPES,

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Retorts, Bench Castings, Condensers, Washers Scrubbers, Wet or Dry Lime Purifiers, Coke Wagons, Fire Tools, Wrought Iron Grate Bars, Gas holders, either Telescopic or Single, with Suspension Frames complete; Wrought Iron Roo Frames, for Iron or Slate; Stop Cocks, Exhausters, Steam Pumps, Boilers and Tanks, Steam o Hand Air Pumps for providing Street Mains Centre Seals, Governors, Wrought or Cast-Iron Line Sleeves for Purifiers, Purifier Hoisting Machines, &c., &c.

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B. Goe, Pres. E. Westervelt, Sec.

CHERRY CREEK FARM PET. CO.,
8 & 10 Wall street. [$2,000,000.]
L. G. Capers, Pres. J. A. Ferguson, Sec.

CENTRAL PETROLEUM CO.
10 Pine street. [$5,000,000.]
J. Bishop, Pres W W. Clark, Sec.

GERMANIA PETROLEUM CO.,
33 Pine street, [$3,000,000.]
J. F. Schepeler, Pr. C. Throckmorton, Sc

GREAT WESTERN CONSOLIDATED
27 Wall street. [$4,000,000.]
F. A. Van Dyke, Jr. Pr. F. W. Potter, Sy

GREAT NORTHERN PETROLEUM,
67 Exchange Place. [$2,000,000.]
J. Bryan, Pres. J. A. Wisner, Sec.

HOFFMAN PETROLEUM CO.
10 Pine street, [$5,000,000.]
G. W. Abbe, Pres. J. P. Hogarth, Sec.

HOME PETROLEUM CO.
10 Pine street. [$5,000,000.]
Josiah Oakes, Pres. E. Dwight, Sec

JOHN ANDERSON PET. CO.
106 Broadway, [$2,000,000.]
A. G. Curtin, Pres. E. O. Perin, Sec.

LITTLE KANAWHA & ELK RIVER,
61 Cedar street, [$6,000,000.]
O. E. Wood, Pres. J. Wadsworth, Sec.

OIL CITY PETROLEUM CO.
8 Pine street, [$500,000.]
D. S. Duncomb, Pres. C. C. Pinckney, Sc

PACIFIC COAST PETROLEUM CO.
71 Broadway. [$5,000,000.]
J. De Peyster Ogden, Pres. L. Benton, Sc

RATHBONE OIL TRACT PET. CO.
69 Wall street. [$5,000,000.]
J. P. G. Foster, Pres. A. L. Purves, Sec.

RYND FARM PETROLEUM CO.,
8 Broad street, [$2,000,000.]
S. J. Macy, Pres. J. F. Jenkins, Sec.

SECOND NATIONAL PET. CO.,
100 Broadway. [$3,000,000.]
M. S. Frost, Prest. J M. Bruce, Jr., Tr

TARR FARM PETROLEUM CO,
61 Cedar street. [$3,000,000.]
J. Wadsworth, Pres. C. W. Ware, Sec.

UNITED REPUBLIC PET. CO.
74 Broadway. [$2,500,000.]
E. J. Lowber, Pres. J. H. Kidder, Secy.

UNITED PETROLEUM FARMS CO.
10 Pine street. [$10,000,000.]
G. H. Bissell, Pres. J. P. Hogarth, Sec.

VIRGINIA & OHIO PETROLEUM CO.
51 Broad street. [$1,000,000.]
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5 William street. [$1,000,000.]
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WEST VIRGINIA OIL & COAL CO.
71 Broadway, [$3,000,000.]
A. F. Ball. Pres. F. A. Miller, Sc.

Great Improvement
IN
Sewing Machines.
EMPIRE
SHUTTLE MACHINE!

Patented February 14th, 1860.

Salesroom, 536 Broadway.

This Machine is constructed on entirely new principles of mechanism, possessing many rare and valuable improvements, having been examined by the most profound experts, and pronounced to be SIMPLICITY and PERFECTION COMBINED.

It has a straight needle, perpendicular action, makes the LOCK or SHUTTLE STITCH, which will NEITHER RIP nor RAVEL, and is alike on both sides; performs perfect sewing on every description of material, from Leather o the finest Nansook Muslin, with cotton, linen, or silk thread, from the coarsest to the finest numbert.

Having neither CAM nor COG WHEEL, and the least possible friction, it runs as smooth as glass, and is

Emphatically a Noiseless Machine!

PRICE OF MACHINES,
COMPLETE:

No. 1, Family Machine, with Hemmer, Feller, Gauge, Braider, & Corder, complete. - - - $60
No. 2. Small Manufacturing, with Extension Table, $75
No. 3. Large Manufacturing, with Extension Table, $85
No. 3. Large Manufacturing, for Leather, with Rolling Foot and Oil Cup, 100

One-half hour's instructions is sufficient to enable any person to work this Machine to their entire satisfaction.

Agents Wanted in all Towns in the United States, where Agents are not already established. Also, for Cuba, Mexico, Central and South America, to whom a liberal discount will be given Terms, invariably CASH on delivery.

T. J. McARTHUR & CO.,
536 Broadway.

WILCOX & GIBBS SEWING MACHINE

It is entirely noiseless.
A patented device prevents it being turned backward.
The needle cannot be set wrong.
It received the Gold Medal of the American stitute in 1863.
InSend for a circular containing full information, notices from the press, testimonials from those using the machine, &c.

JAMES WILLCOX,
Manufacturer, 508 Broadway, New York
Principal Offices:
NEW YORK—508 Broadway.
BOSTON—323 Washington street.
PHILADELPHIA—720 Chestnut street.
CHICAGO—133 Lake street.
CINCINNATI—70 West 4th street.
LONDON—135 Regent street.
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PARIS—82 Boulevard de Sebastopol.
ST. PETERSBURGH—15 Gorochovay.
VIENNA—9 Wildpretmarket.
BRUSSELS—12 Rue Croisade.
SYDNEY, AUSTRALIA—292 Pitt street

GAS-BURNERS.

T. G. ARNOLD,
MANUFACTURER OF
GAS-BURNERS
And Importer of SCOTCH TIPS,
224 and 226 West 21st street,
formerly No. 447 BROOME ST., New York.
Mercury Cups, Portable Sockets, Burner Pillars, Burner Pliers, &c., &c.

C. GEFRORER,
Manufacturer of
GAS-BURNERS,
For Lighting and Heating Purposes.
GAS HEATING AND COOKING APPARATUS; FITTERS' BOVING APPARATUS, &c.
529 Commerce st., bet. Market & Arch, Philadelphia.

WOODEN PURIFYING TRAYS
PATENT
Conically Slotted Solid Wood Sieves
FOR PURIFILRS.

The Conically Slotted Solid Wood Tray or sieve was patented 21st October, 1862, and all persons are cautioned against purchasing them of any other person except the subscriber. The following companies are now using these trays.

Manhattan, New York,
Metropolitan,
New York
Albany,
Troy
Brooklyn, L. I.
Williamsburgh,
Citizens
Baltimore Md.
Louisville, Ky.
Chicago, Ill
Cambridge,
And numerous others

Orders eceived by mail or otherwise.
JOHN L CHEESMAN.
147 Avenue C New York City

WEST'S IMPROVED PUMPS, the most Simple, Durable, and Powerful, and the Cheapest in use.
J. D. WEST & CO.,
No. 40 Cortland street,

JOSEPH LENNIG,
1615, 1617, and 1619 Francis St.,
Above Ridge Avenue, Philadelphia, Pa.,
MANUFACTURER OF
WET & DRY GAS METERS,
STATION, SHOW, & EXPERIMENTAL METERS,
Photometers, Pressure Registers, Indicators, and Gauges, Governors, Meter Provers, Centre Seals, Fluid Gauges, &c.
GAS APPARATUS
Of the most reliable and approved construction manufactured and on hand at the
UNION GAS METER WORKS.

D. PARRISH, Jr.,
GAS ENGINEER
And Contractor for Coal or Oil Gas-Works.
Estimates given for Gas-Works, Gas-Holders, or any Gas Apparatus.
205 1-2 Walnut st., Philadelphia, Pa.
Box 1956, Post Office.

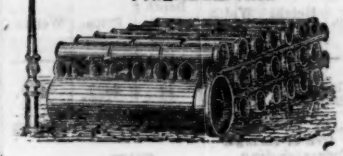
To Manufacturers of Petroleum Gas.
For sale, Parrish's Patent Gas and Air Mixer, adapted to all works using Petroleum or other oils, by which rich Petroleum Gas is mixed, after it leaves the holder, with a proper proportion of air, giving it the greatest illuminating power, without smoke, through any burners. The apparatus being attached to the outlet pipe, requires no alteration of the works.

Apply at the Gas-Works of St. Nicholas Hotel, No. 63 Mercer st., N. Y., where one can be seen in operation; or address D. Parrish, Jr., St. Nicholas Hotel, New York city, or No. 1416 Arch street, Philadelphia.

TO GAS COMPANIES.
THE UNDERSIGNED DESIRES TO undertake the supervision of several small Gas-works, to visit and examine them as often as may be necessary; to obtain and inspect their coal, castings, fire-brick, and other materials; and to manage their general business in such a manner that they shall be under such supervision as is now attainable in large works, at much increased cost. Also, to advise as general Consulting Engineer and expert in practical chemistry.
CHAS. M. CRESSON,
Late Asst. Engineer of the Philadelphia Gas-works
417 Walnut st., Philadelphia.

THE AUBIN
GAS-WORKS COMPANY,
Of Albany, N. Y.,
Now contract their works to make 10,000 feet of good Gas from 2,000 pounds of *hard* wood and 40 gallons of kerosene tar, *before payment can be demanded;* and the charcoal is worth the cost of the wood.
Many Village Gas Companies can be referred to.

R. D. WOOD & CO.,
MANUFACTURERS OF
CAST-IRON PIPE, RETORTS, &c.
Office, 400 Chestnut Street,
PHILADELPHIA.



Carrington & Co.'s
GENERAL
PURCHASING
AGENCY,
In Connection with all the Expresses
No. 30 Broadway,
NEW YORK.

Established 1854.

Purchases to order ANY article wanted from New York, (or from Europe,) for ladies' or gentlemen's use or wear,—comfort or luxury—from a cameo to a cashmere—a sea ring to a steam-engine.

Goods purchased at current City prices, and forwarded by Express, or as directed.

Commission, Five Per Cent.

Remittances, with orders, can be made by Express if preferred, as all Express Agents will take orders, receipt for and forward funds, and see to return of Goods.

SPECIAL CIRCULAR.

The Adams Express Company, appreciating the need of a capable medium connecting with the various Express Lines, through which personal and other orders for goods from this city, can be satisfactorily supplied, do recognize CARRINGTON & CO.'S GENERAL PURCHASING AGENCY as such a medium for filling orders for every description of goods wanted from New York, and commend it to the attention of the public, and of our general and local agents, recommending our agents to extend to it all reasonable aid, by facilitating the distribution of its cards and circulars, and making known the advantages it affords.
ADAMS EXPRESS CO.
By W. B. DINSMORE, Prest.
NEW YORK, June, 1864.

We cheerfully concur in the above recommendation of the Adams Express Company.
AMERICAN EXPRESS COMPANY,
By HENRY WELLS, Prest.
UNITED STATES EXPRESS COMPANY,
By D. N. BARNEY, Prest.
WELLS, FARGO & CO.,
NATIONAL EXPRESS COMPANY,
By J. A. ULLER.
HARNDEN EXPRESS,
By L. W. WINCHESTER, Supt.
KINSLEY & CO.'S EXPRESS,
By E. LITTLEFIELD, Supt.
HOPE EXPRESS COMPANY,
A. D. HOPE, Supt.
BREESE & CO.'S EXPRESS,
By STEPHEN BREESE, Supt
NEW JERSEY EXPRESS COMPANY,
By GEORGE R. DUNN, Sup

The Greatest Improvement yet in the Sewing Machine Art!

A CURIOSITY WORTH SEEING!

Please send for circular with sample of sewing.

These Improved Machines save ONE HUNDRED PER CENT. of thread and silk, and make the LOCK-STITCH alike on both sides.
They require no instruction to operate perfectly, except "the printed directions."
No change in sewing from one kind of goods to another.
And no taking apart to clean or oil.
Our NEW MANUFACTORY is now complete, with all its machinery and tools entirely new, and is already rapidly turning out Machines which for BEAUTY and PERFECTION of FINISH are not surpassed by any manufacture in the world.
N. B.—Should any Machine prove unsatisfactory, it can be returned and money refunded.
Agents wanted in counties not vassed by ur own agents.

Finkle & Lyon S. M. Co.
No. 508 BROADWAY, NEW YORK.

GROVESTEEN & CO.,

PIANO-FORTE MANUFACTURERS.

499 BROADWAY, NEW YORK.

The attention of the public and the trade is invited to our New Scale Seven Octave Rosewood Piano-Fortes, which for volume and purity of one are unrivalled by any hitherto offered in this marked. They con-ain all the modern improvements, French, grand action, harp pedal, ron frame, over-strung bass, etc., and each instrument being made under the personal supervision of Mr. J. H. Grovesteen, who has had a practi-eal experience of over thirty years in their manufacture, is fully warran-ted in every particular.

THE "GROVESTEEN PIANO-FORTE"

Received the highest award of merit over all others at the Celebrated World's Fair!

where were exhibited instruments from the best makers of London, Paris, Germany, Philadelphia, Baltimore, Boston, and New York; and also at the American Institute for five successive years, the gold and ilver medals from both of which, can be seen at our warerooms.

By the introduction of impro ements we make a still more perfect Piano-Forte, and by manufacturing largely, with a strictly cash system, are enabled to offer these instruments at a price which will preclude all competition.

PRICES.

No. 1, Seven Octave, round corners, Rosewood Plain Case $275.
2, Seven Octave, round corners, Rosewood Heavy Moulding, $300
No. 3, Seven Octave, round corners, Rosewood Louis XIV, style $325, a fac-simile of the accompaning cut.

TERMS—NET CASH, IN CURRENT FUNDS. Descriptive Circular sent free.

LILLIE'S

CELEBRATED

Chilled and Wrought Iron Safes,

WROUGHT IRON FIRE-PROOFS,

LOCKS AND VAULT DOORS.

These Fire-Proofs are manufactured to supply a demand for Security Against Fire, less expensive than my celebrated and superior Chilled and Wrought Iron Burglar and Fire-Proof Safes.

They furnish similar and equal security to the Safes generally manufactured in the different cities, but are SUPERIOR to them in their Fire-Proof qualities and durability, the iron being effectually rotected from rust in any climate, and the Fire-proof not subject to lose its utility by age. This is n important advantage gained to the purchaser, as Safes often rust out and become worthless in wo or three years.

To substantiate my position, those purchasing these Fire-Proofs are at liberty, by giving me due notice of time and place of trial, to test them by fire with any other Safe of the same size; and should they not prove superior, I will refund the money, or a new Fire-Proof, as the purchaser may decide.

LIST OF SIZES & PRICES OF WROUGHT IRON FIRE-PROOFS

	Outside.			Inside.			
No.	Height.	Width.	Depth.	Height.	Width.	Depth.	Price.
6	40	31	27	31	21	15	$150
5	34	21	26	24	21	14	125
4	31	27	25	22	18	13	110
3	30	24	24	21	15	12	100
2	28	22	23	20	14	12	75
1	24	19	20	17	11	10	50

Sample of Fire-Proof Safe at Office of the Am. Ad. Agency, 389 Broadway, N. Y.

PRICE LIST.

LILLIE'S CELEBRATED CHILLED & WROUGHT IRON SAFES.

BANK, FIRE, AND BURGLAR SAFES.
Folding Doors, D Lock.

OUTSIDE.				INSIDE.			
No.	Height.	Width.	Depth.	Height.	Width.	Depth.	Price.
	In.	In.	In.	In.	In.	In.	
1	66	50	29	54¼	39	18	$950
1½	59	50	26	48	39	15	800
2	53	44	27	42¼	33	15	600

MERCANTILE F AND B SAFES.
Folding Doors and Monitor Locks.

3	50	42	27	40	32	16	$500
4	46	42	27	36	32	16	450
4½	38	46	27	28	36	16	450
5	42	38	27	31½	27½	15	350

Single Doors and M. Lock.

6	38	35	26	27½	23½	15	$250
7	34	31	26	24	21	14	200
8	31	28	24	21	18	13	175
9	30	24	24	21	15	12	140
10	26	22	22	19½	13½	12	120
11	24	20	18	17	17	10	100

HOUSE SAFES.

SIDE BOARD	$600
DINING ROOM	350
PANTRY (No. 1)	275
PANTRY (No. 2)	150
DUODECAGON BANK LOCK	100
MONITOR SAFE do.	50
SAFE do.	10

NATIONAL BANK SAFES,
With 2 Inside Burglars and 1 D and 2 M Locks.

OUTSIDE.				INSIDE.			
No.	Height.			Hei	Width.	Depth.	Price.
	In.			In.	In.	In.	
1	68			55	39	18	$1,200
2	61			48	39	18	1,050
3	57			42½	33	18	900

BANK VAULT BURGLAR SAFES,
With Folding Doors and D Lock.

0	68	53	27	64	48	20	$1,000
0½	61	53	27	55	46	20	800
1	57	47	27	49	40	20	600

BANK VAULT BURGLAR SAFES,
Single Doors and D Lock.

2	53	32	26	49	28	
	42	24	22	38	32	19
4	36	31	20	32	27	
5	30	24	18	26	20	14

BANK VAULT DOORS AND FRAMES,
D and S Lock.

No.	Height clear.	Width clear.	Depth adjust-able.	Price.	Weight.
	In.	In.	In.		
1	72	27	20	$400	3,000
2	72	27	20	275	1,500

Orders received and filled at net cash prices, by the AME[illegible]N VERTISING CY, 389 Broadway, New York. All Safes shipped from Troy free of cartage. ....sfers Depart., E. ALVORD. *Corresponding* OWLER

WEST'S IMPROVED PUMP.

Anti-F eezing, Double-Acting, Forcing, and Lifting

These Pumps have now been in general use a number of years, and give better satisfaction than any other, and are recommended as

THE BEST!

by CAPTAIN ERICSSON and other eminent engineers. We can refer to thousands using them, a guarantee that all will recommend them. They are more simple in construction, and work easie and cost less than all others.

"Our readers will find the double acting, improved pump of J. D. West & Co., one of the best in the market. It is very simple, works to a charm, so that any child may use it; throws a steady continuous stream, and does not freeze in the coldest exposures, and is unusually cheap. We say this knowingly, and give the testimony of our own accord, without the knowledge or request of the proprietors."—*New York Evening Post, July 1st*, 1863.

"J. D. WEST & Co.: We are pleased to state that the Pumps we had of you about a year ago, have been in constant use, twelve hours each day, and raise for the use of our woolen factory, about 180 gallons per minute. They work with but little power, compared with pumps we have used before, and do not get out of repair, and are satisfactory in all respects.

"DUNLAP MANUFACTURING CO."

Solon Robinson to the Farmers' Club.

Jan. 28.

"No farmer who owns a well or cistern can possibly afford to be without an iron pump. It should be a once a suction and force pump—a perfect little fire engine—such a one known as 'West's Improved Pump.' I speak of this Pump because I happen to know it....to be very simple, durable, powerful and cheap, and it don't freeze up, nor get out of order once a year....I know this, and think I may be doing the farmers good by speaking of it....A boy ten years old can work it, and throw a continuous inch-and-a-quarter stream....It can be made to work in deep wells as well as ni shallow ones."

"The undersigned having to use "West's Improved Pumps," cheerfully recommend them as simple, durable, and powerful in raising and throwing water, and for their ease of action, security against frost, and low price, we believe them superior to all others.

"WARREN LELAND, Met. Hotel, N. Y.
"J. W. POMEROY, Yonkers, N. Y.
"JOHN MESSEREAU, N. Y.
"DOMINICK LAWRENCE, Westchester."

From the New York Observer.

"We have had in use for months past one of West's Pumps, which has given us more satisfaction as a force and lifting pump than any we have ever used. It is one of great power, and well adapted for ship's decks, mines, factories, greenhouses, graperies, etc. *The Mining Chronicle and Railway Journal* says: 'It is recommended for its extreme simplicity of construction, great strength, and consequent durability and cheapness of repair. There is no stuffing-box—the pressure being held by a cup packing, like that upon the working-piston, working in a cylinder, fitted for the purpose within the upper air chamber—which we think a great improvement, as stuffing is so liable to be deranged and leak under strong pressure, to say nothing of the loss by friction incident thereto. It has also two air-chambers; thus the action of the valve is cushioned upon both sides by air—preventing water-hammer and vacuum-thump. The valves are very accessible and simply and cheaply repaired. They work much easier than any pump we have ever seen; the 4-inch cylinder being worked by children in wells 100 feet deep, and as they are extremely cheap, as well as simple and strong, we freely recommend them.'"

"CAMBRIDGE MINE, N. C., June 15, 1863.

"J. D. WEST & Co.—Gents: The Pump which I ordered for our mine is received, and put to work in our underlay shaft, which we are sinking. We find that one man will, with ease, lift 50 gallons per minute. We lifted in three and a half hours all the water in the shaft, which measures seven by twelve feet and thirty feet deep, and it was full when we commenced. It answers our expectations in every respect, and our workmen are highly pleased with it. It will do great service with but trifling expense for repairs.

"Yours, respectfully, BURR HIGGINS."

"This may certify, that I have been using, at my manufactory, for the last four years, 'W s Improved Pumps.' I now have in use three of said Pumps, one of which is kept constantly work, 24 hours of each day (save Sunda , and has been running for the past two years. I pronounce them, unhesitatingly, the best Pumps that have been brought to my notice, having used many others previously. They are simple in their construction, and not easily disarranged.

"N. Y., Oct. 10, 1859. JAS. A. WEBB."

We have plenty more such certificates, but think these are enough. For Pumps, Hose, Pipe, etc., address or call upon

J. D. WEST & CO., 40 Cortlandt st., New York.

Orders may be sent through the AMERICAN ADVERTISING AGENCY, 389 Broadway

EDDY'S

Kerosene Cooking & Heating

STOVES AND RANGES.

THESE COOKING STOVES WILL

☞ *Bake, Boil, Stew, Fry and Roast,*

With the greatest economy and facility, and without heating the room in which they are used. They are perfectly simple, operating like an ordinary Kerosene Lamp with a chimney, and are the only Kerosene Stoves that burn without smoke or odor.

"We have been perfectly astonished to see what a labor-saving, dirt saving and heat-saving institution is EDDY'S PATENT KEROSENE STOVE. Taking the cost of running it, and the result attained, it is the best patent in the market."—*Worcester Daily Spy.*

Our Heating and Cooking Stoves are very convenient and economical, especially where a fire is required but a few hours at a time.

Orders for Stoves may be sent through American Advertising Agency, 389 Broadway, New York.

LESLEY & ELLIOT,

Manufacturers, No. 494 Broadway, New York.

Send for Illustrated Circular. (136

KNITTING MACHINES

FOR

Families and Manufacturers,

☞ *Something New and Invaluable for Family Use.*

We offer the public the simplest, strongest and best Knitting Machine in the world.

It occupies but little space—is portable and can be attached to a stand or table, weighs about 40 lbs.

It will knit a variety of Stitches—the breakage of needles is trifling—the cost of needles is insignificant and the most delicate material can be knit pure and spotless, as the needles are not oiled.

Orders for Machines may be sent through the American Advertising Agency,

389 Broadway, N. Y.

Send for a Circular—Agents wanted.

DALTON KNITTING MACHINE CO.,

137] 537 Broadway, N. Y.

WEED'S

HIGHEST PREMIUM

Shuttle Sewing Machine

Has only to be seen and operated to be Appreciated.

Call and see for yourself before purchasing. Please bring samples of various kinds of thread, (such as is usually found at stores,) and various kinds of fabric, which you know the former most popular Sewing Machines either cannot work at all, or, at best very imperfectly.

SUPERIORITY.

over any other Machine in the market will be seen at a glance.

1st. It runs easily and rapidly, and is so constructed as to endure all kinds of hard usage.

2d. No breaking of threads in going over seams.

3d. No imperfect action of the feed at uneven places in the work.

4th. The Weed-stitch catches of itself, and will sew from the finest lace to the heaviest leather, and 200 cotton to coarse linen thread.

5th. The Weed Machine will do beautiful quilting on the bare wadding, without using inner lining; thus leaving it soft as if done by hand.

6th. The variety of fancy work that can be done on the

WEED MACHINE,

with so little trouble, makes it equal, if not superior, to six machines combined; for instance. it Binds, Hems, Tucks and Sews on the band at the same time, and in face, the

WEED NO. 2 MACHINE,

as before stated, is equivalent to a combination of any six ordinary machines.

Orders for Machines may be sent through the American Advertising Agency, 389 Broadway, N. Y.

Below we give a few prices:

No. 2. Oil Black Walnut, Ornamented with Hemmer.	$60,00
No. 2. Oil Black Walnut, Hall Case, Ornamented, with Hemmer.	65,00
No. 3. Extra Oil Polished Black Walnut, Half Case, Large Table beautifully Ornamented.	75,00

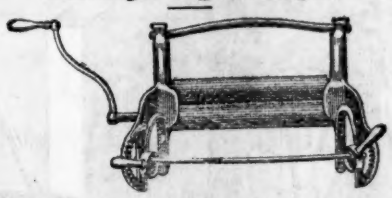
WEED SEWING MACAINE Co.,

36) 506 Broadway, New York

PUTNAM'S CLOTHES WRINGER.

IT IS THE ONLY RELIABLE

Self-Adjusting Wringer.



No Wood-work to Swell or Split. No Thumbscrews to get out of order. Warranted with or without Cog wheels.

It took the First Premium at Fifty-seven State and County Fairs in 1863, and nearly double that number in 1864, and is, without an exception, the *best* Wringer ever made. Patented in the United States, England, Canada, and Australia. Agents wanted in every town, and in all parts of the world. Energetic agents can make from $8 to $10 per day.

WHAT EVERYBODY KNOWS, VIZ.:

That Iron well galvanized *will not rust.*

That a *simple* machine is better than a complicated one.

That a Wringer should be *self-adjusting, durable, and efficient.*

That thumb-screws and fastenings cause *delay* and *trouble* to regulate and keep in order.

That wood soaked in water will *swell, shrink,* and *split.*

That wood-bearings for the shaft to run in *will wear out.*

That the Putnam Wringer, with or without cog wheels, will *not tear the clothes.*

That cog-wheel regulators are not essential.

That the Putnam Wringer has *all* the advantages, and *not one* of the disadvantages above named.

That all who have tried it pronounce it the *best* Wringer ever made.

That it will wring a thread or a bed-quilt *without alteration.*

We might fill the paper with testimonials, but insert only a few to convince the skeptical, if such there be; and we say to all, *test* Putnam's Wringer. Test it *thoroughly* with *any* and any others, and if not entirely satisfactory, return it;

PUTNAM MANUFACTURING CO.—*Gentlemen:* I know from practical experience that iron well galvanized with zinc will not oxydize or rust one particle. The Putnam Wringer is as near perfect as possible, and I can cheerfully recommend it to be the best in use. Respectfully yours,

JOHN W. WHEELER, Cleveland, O.

Many years' experience in the galvanizing business enables me to indorse the above statement in *all particulars.*

JOHN C. LEFFERTS, No. 200 Beekman St.

NEW YORK, *January,* 1864.—We have tested Putnam's Clothes Wringer by practical working, and know that it will do. It is cheap; it is simple; it requires no room, whether at work or at rest; a child can operate it; it does its duty thoroughly; it saves time, and it saves wear and tear. We earnestly advise all who have *much* washing to do, with all intelligent persons who have *any,* to buy this Wringer. It will pay for itself in a year at most. HORACE GREELEY.

PRICES—$8, $9, and $10.

Sample Wringers sent, express paid, on receipt of price.

Manufactured and sold, wholesale and retail, by

PUTNAM MANUF'G CO.,

18 PLATT STREET, New York,
BENNINGTON, Vt.,
CLEVELAND O.

WATER AND GAS PIPE.

The Boston Bituminized Pipe Company,

Are now manufacturing and prepared to take orders, for their PATENT PIPE, (from 2 to 12 inches in diameter,) as a substitute for Iron, Copper, Lead, &c., for the conveyance of WATER, GAS, SEWERAGE, &c. &c.

From the testimonials received, and the entire satisfaction it has given those having it in use, we feel warranted in claiming for this pipe over that of any other, the following advantages, viz:

It is much CHEAPER—has great strength (it having been tested to 500 lbs. to the square inch,) combined with LIGHTNESS, costing less for transportation; the joints are easily made and perfectly tight; it does not expand or contract from different degrees of temperature, and is free from *CORROSION* or *CONCRETIONS* forming; does not impart any taste or injurious properties to water, and as far as anything can be said to be indestructible, we deem this to be.

As a GAS PIPE, we say it has no superior. The Lowell Gas Light Co., purchased and laid some of this Pipe last year, and have likewise subjected samples to a test of four month's duration in their dry lime purifiers, with the most satisfactory results, in fact establishing beyond a doubt, its perfect adaptation to the wants and requirements of Gas Companies. specimens of which, together with the statement of S. Cushing, Esq., Agent Lowell Gas Light Co., who made these experiments. I shall be pleased to show, and give all other needed information, by applying in person, or by letter, to JOHN L. WEBSTER, Treas.,

Boston Bituminized Pipe Co.,

127] No. 2 Pearl st. House, Boston.

AMBROSE SPENCER GILCHRIST.

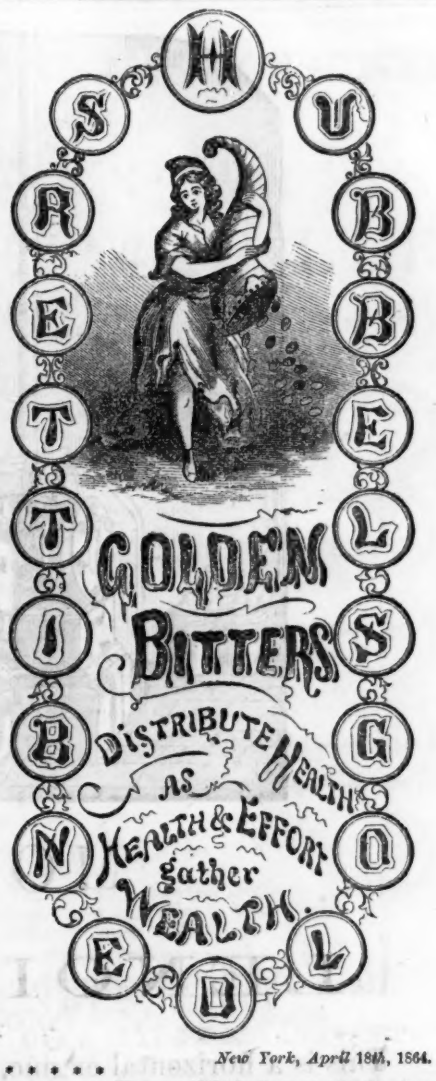
(LATE CAPT. U. S. V.,)

CIVIL, MINING

AND ARCHITECTURAL ENGINEER,

No. 200 BROADWAY, Office 12.

New York.



New York, April 18*th*, 1864.

* * * * * *

We respectfully invite your attention to and consideration of the justly celebrated and reliable remedy for DYSPEPSIA, HEARTBURN, DEBILITY and PROSTRATION. The Proprietors are proud to acknowledge the unparalleled success which has attended the sale of their valuable preparation, known in nearly every portion of the civilized world as the

"GOLDEN BITTERS."

We risk nothing when we term them a *valuable preparation,* for they are one of the few articles of the present day which are not a humbug; and we are willing and able to satisfy any person or persons who will call upon us, that the celebrated "GOLDEN BITTERS" are a genuine *bona-fide hygienic* article. It is the wish of the proprietors that the virtue of the article be tested before condemning. A decision of their merits by any one who has tried them, is worth a million of purchased bogus testimonials.

For Creating a Healthy Appetite

they are invaluable, and are unequalled as a TONIC. They are mild in their action, and operate by giving *vigor* and *strength* to the system,—not by any change they produce in the solids, but through the medium of the living principle.

They are Purely Vegetable,

being composed of Gentian Root, Calamus, Sassafras, and many other remedial agents of the Vegetable world, all preserved in Jamaica Rum and Sherry Wine.

As a Beverage,

They are the most *wholesome, invigorating* and *palatable* stimulant ever offered to the public And the fact of their being prepared chemically and scientifically, precludes the possibility of a bitter, unpleasant taste, common to Bitters generally offered for sale. We especially recommend them to LADIES, and particularly to those suffering from

DEBILITY, WEAKNESS, AND PROSTRATION.

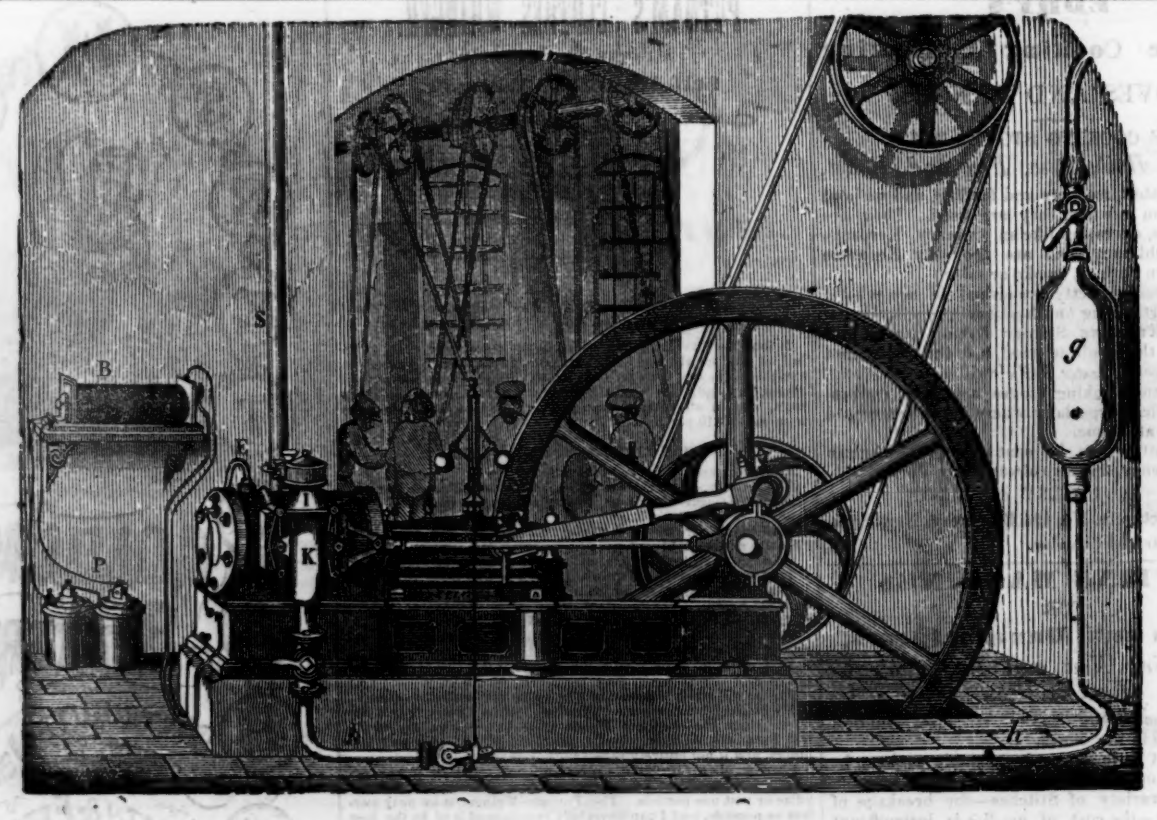
Half a wine glass of these "Bitters" three or four times a day, will produce a remarkable healthy change in persons greatly debilitated.

The "Golden Bitters" have been tried and not found wanting. They are put up in our own *Patent* quart bottles, and for sale by Druggists, Grocers, &c., throughout the world. Each bottle bears a fac-simile of the signature of Hubbel & Co.

GEO. C. HUBBEL & Co, Sole Proprietors

CENTRAL DEPOT, American Exp. Building, New York.

THE GOLDEN BITTERS.—We are not an advocate of stimulants or an alcoholic character; indeed we deprecate this "daily tonic" idea—this "morning toddy" which we see offered in all sorts of shapes as a recuperator, invigorator, revitalizer, &c. As a rule all artificial stimulants are dangerous remedies, and must be taken into the system as you would mercury or arsenic, in very small doses. But we have had an opportunity to try the now well-advertised article known as Hubbel's Golden Bitters, and are frank to say that where the system needs building up, where a stimulant is required to aid nature in restoring a lost appetite and infusing a vigorous action to the debilitated functions, we can recommend these Bitters. Hubbel's Golden Bitters are evidently intended to improve the debilitated human system, rather than to tickle the palate, and are, therefore a harmless and safe remedy keep in the house.—*New York Weekly Day Book.*



MOTEUR—LENOIR.

LENOIR GAS ENGINE.

This is a horizontal engine, in which a piston, by a connecting rod drives a horizontal shaft.

The gas enters by the pipe "h" from the regulating reservoir "g," (made of vulcanized india-rubber,) which regulates the feeding and the branches connected with the gas-pipe.

The tube, K, receives the gas conveyed by the pipe "h," and conducts it to the valve, which opens and closes alternately, by means of a rod moved by an eccentric wheel fastened to the end of the shaft.

Two of Bunsen's piles, P, sufficient to produce the electricity are placed at a little distance from, and in communication with a Ruhmkorff electric apparatus, B. The electric current of this apparatus is conducted by means of insulated wires to the electricity distributor "m," placed on the front of the frame, while the current of electricity and its arrival at the inflammator, inserted at each end of the cylinder, is directed by the movement of the piston-rod, which, by an ingenious combination, impels a small movable slide before the distributor.

The burnt gas, after having performed its functions in the machine, escapes, by means of a valve, through a pipe, S, and the water designed to cool the interior of the cylinder enters through a double passage, by means of a pipe situated near the escape-valve, and goes out by the pipe, E.

A two horse and a half horse Engine are now in practical operation at the Dry Dock Iron Works, No. 435 East Tenth street, near East River, New York, where they are being manufactured, and those interested are invited to call and examine them.

THE LENOIR GAS ENGINE

Requires no Fire and makes no Smoke,

No Noise, no Dirt, and is thoroughly safe.

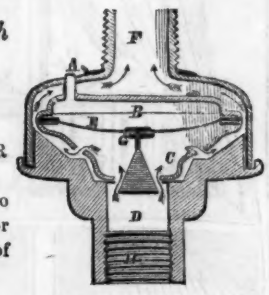
It is propelled by the expansion of Air, dilated by the combustion of Gas within the cylinder, ignited by the

ELECTRIC SPARK

NOTICE TO GAS COMPANIES AND GAS CONSUMER

THOMPSON'S PATENT GAS CONTROLLER,

The only Self-Acting Gas Controller, Regulator, and Burner Combined which has ever been invented, or known to science.



THE PRINCIPLE UPON WHICH THE THOMPSON'S AUTOMATIC GAS CONTROLLER works is one well known to mechanics, and is simple in its operation.

Within the circumference of a small cylinder below the burner is placed a conical valve attached to a movable diaphragm. The diaphragm rises or falls as the pressure of gas from the pipe is lesser or greater, and the valve acts upon the valve-seat with such regularity of movement that in a difference of om five-tenths of an inch pressure to five inches the variation in flame is hardly perceptible.

The simplicity of its machinery and the nature of the material used in its construction insure its regular action and durability.

In consequence of the uniform quantity of gas which passes the Controller to the burner, there is no waste, and a steady, soft flame is produced, which is important to all who read, write, or work by gas-light. The unsteady flickering blaze which invariably exists when the pressure of gas is beyond the requisition for consumption, has injured the sight of thousands who have been subjected to it.

For street lamps these Controllers are especially valuable, because the pressure varies materially during the night, and in consequence there is a waste of gas, and the light variable.

Improvements have lately been made in the mechanism of the Controller which makes them almost a perfect meter to each burner, and they are now offered to he public with more confidence than ever before.

Reference is permitted to the following named gentlemen—

Col. CHAS. ROOME, President Manhattan Gas Company, N. Y.
C. H. SAND , Esq., President Metropolitan Gas Company, "
J. H. ADAM, Esq., President New York Gas Company, "
PETER COOPER, Esq., Cooper Institute, "
JOHN A. DUFF, Esq., Olympic Theatre, "

GEO. H. KITCHEN, Inspector of Gas Meters, N. Y
A. L. BOGART, Esq., Gas Engineer.
Col. J. A. SABATTON, Engineer Manhattan Gas Company.
Col. A. J. WHITE, Engineer Metropolitan Gas Company.
J. K. SIMPSON, Esq., Engineer Cooper Institute.

Persons interested are invited to call at the Office, 111 Pearl street, where they can see the operation by pressure guage and test meters]

M. L CALLENDER, Agent
Office, 111 PEARL STREET.

THE AMERICAN METER CO.

Organized under the General Manufacturing Laws of the State of New York

SAMUEL DOWN, PRESIDENT. HENRY CARTWRIGHT, VICE PRESIDENT. RICHARD MERRIFIELD, SECRETARY AND TREASURER

TRUSTEES,

SAMUEL DOWN, WILLIAM HOPPER, R. H. GRATZ, HENRY CARTWRIGHT, RICHARD MERRIFIELD.
THOMAS C. HOPPER, *Superintendent at Philadelphia.*

This Company is now prepared to furnish WET AND DRY GAS METERS, STATION METERS, GOVERNORS, PRESSURE INDICATORS & REGISTERS, SERVICE and METER COCKS, and all other articles in their line appertaining to the use of Gas-Works.

The combination of Mechanical and Scientific Skill, and the long experience of the several members of the Company, is a sure guarantee of durability, accuracy and excellence of workmanship. Orders addressed

AMERICAN METER COMPANY,

West Twenty Second Street, New York. Arch and Twenty Second Streets, Philadelphia. No. 23 West Street, Boston will meet with prompt attention.

Harris & Brother, Practical Gas Meter Manufacturers,

Continue, as heretofore at their old Establishmen, No. 1117 CHERRY ST., PHILADELPHIA, to Manufacture

WET AND DRY GAS METERS, and all kinds of GAS APPARATUS, and furnish all articles appertaining to the use of Gas Works. ☞OUR WORK WARRANTED—Satisfaction Guaranteed. Orders respectfully solicted, and promptly attended to, by
HARRIS & BRO., No 1117 Cherry st., Philadelphia.

Messrs Harris & Brother,

Philadelphia Gas Works, February 14, 1857.

Dear Sirs;—I take great pleasure in stating that we have found your meters to register with entire correctness, and to be generally of very good quality—the number furnished by you to these works is over 5,000.

JOHN C. CRESSON, Enigneer;

Office of the Gas Light Company of Augusta, Ga., March 6th, 1858.

This is to certify that having used meters manufactured by Messrs. Harris & Bro., for the last nine years, we do not hesitate to state they have given entir8 satisfaction in point of wokmanship and accuracy of registration; they are surpassed by none, and equaled by few manufactories in the Union; we have used meters made by other establishments but our preference is in favor of those made by Harris & Bro., of Philadelphia, Pa.

G. S. HOOKEY, Superintendent of the Gas Light Company of Augusta, Georgia.

Messrs. Harris & Brother, Philadelphia.

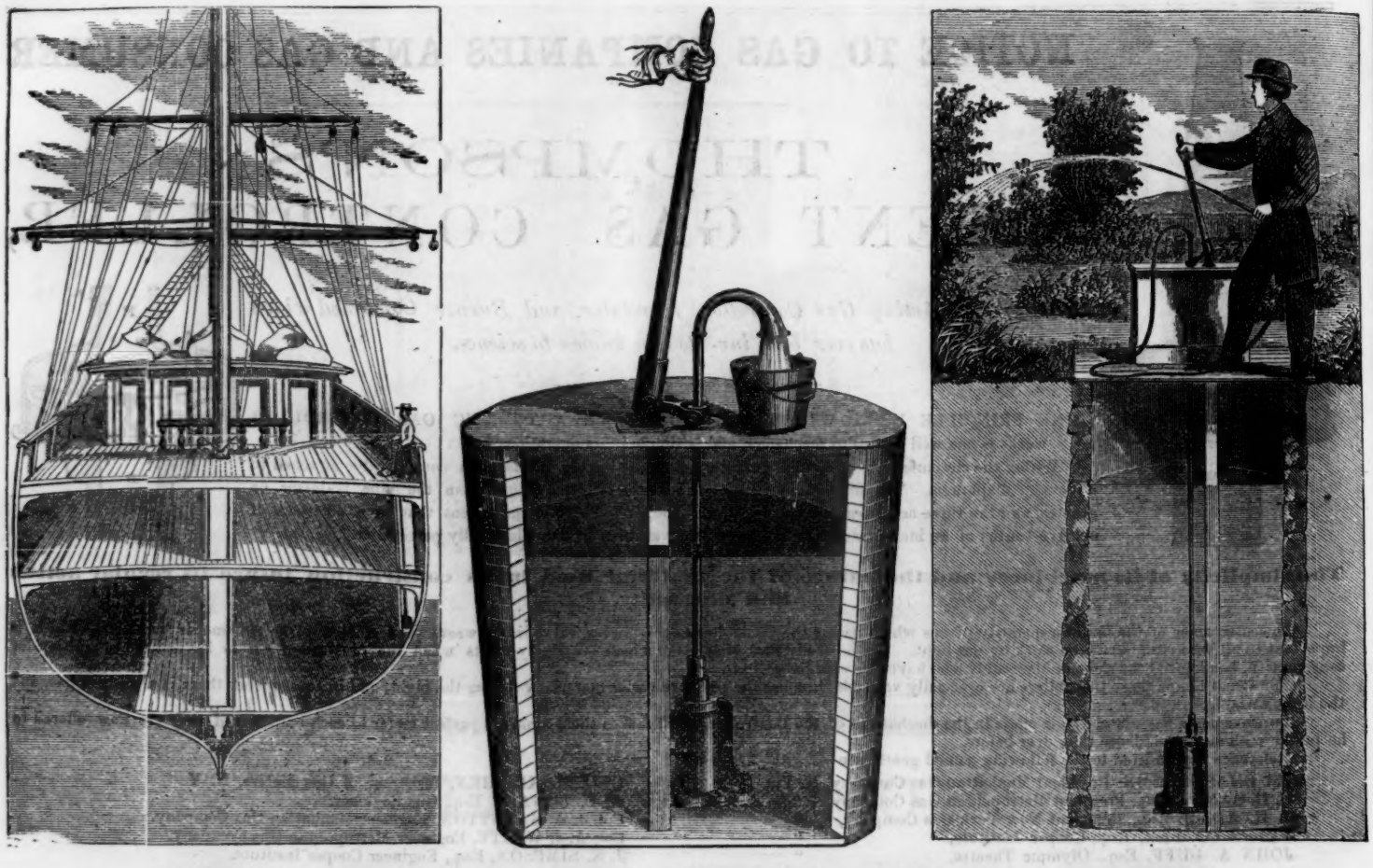
Philadelphia, March 4, 1858.

Gentlemen—We take great pleasure in bearing our testimony to the very superior character of the meters we have received from your establishment. We have always found the workmanship all we could desire, while the accuracy and reliability of their measurement have always been satisfactory. We have used meters made by other parties, and none have given as entire satisfaction as those received from you. We are, gentlemen, very truly, yours, BIRKINBINE & MCARS.

Messrs. Harris & Brother.

March 14, 1857.

Gentlemen—For the last ten years we have used in the Philadelphia Gas Works, meters made in your factory, and take pleasure in expressing my opinion to their correctness. On several occasions I have taken your meters apart, and found the material used in the manufacture of the same, to be as fine quality as is used in those imported from Europe, or made by any of the manufacturers in the United States. Respectfully Yours, GEORGE WIEGAND, Inspector of Gas Fittings, Philadelhia.



THE AMERICAN SUBMERGED PUMP,

OWNED BY THE AMERICAN PUMP MANUFACTURING CO., NEW YORK.

OFFICE, No. 40 DEY STREET.

ITS ADVANTAGES.

This valuable Invention, now first introduced, will, it is believed, supersede all clases for any purpose in use at the present time.

FIRST.—SIMPLICITY. The entire pump is composed of but six parts, all of cast-iron, which can be put together by any mechanic.

SECOND.—DURABILITY. From the fact that it is always submerged, it is perfectly lubricated, and requires no packing. As no water can remain in the pipe when not in motion, there is no danger of freezing.

THIRD.—CAPACITY. It is contended that, for the power applied, this Pump excels all others. The No. 1 (the smallest size,) of this Pump, with the power of one hand, has a capacity of thirty gallons per minute, and will throw a stream seventy feet in the air.

FOURTH.—CHEAPNESS. For economy, this Pump surpasses all others, its first cost being about one-third less than that of other Pumps of the same capacity, and being much less both in size and weight, there is a great saving in transportation.

ITS USES.

FIRST.—For a House Pump; the smallest size of the patent Submerged Pump is sufficient for all family purposes. Placed in a well or cistern, water may be conveyed to every room in a common sized house.

SECOND.—For a Farm Pump; for all purposes connected with irrigating, watering stock, etc., etc. This Pump can be placed in running streams, ponds, bayous, etc,, and water conveyed to any required distance.

THIRD.—For a Ship Pump; Any ship owner or captain, with short experience in the use of this Pump, will give his unqualified approval for ship purposes, either to be used as a bilge pump simply, or for washing decks, etc. From its simplicity, as a bilge Pump it will be found entirely free from choking, and will clear grain, dirt, stones, etc., with ease.

FOURTH.—For a Factory Pump, or for air in Oil Wells, for Breweries, or for pumping acids, hot liquors, etc., it is invaluable. It cannot be affected by any liquid.

FIFTH.—To all Directors and Officers connected with mining interests, the PATENT SUBMERGED PUMP presents great advantages.

The experience of the last five years have clearly proved at what great expense, both in first cost and freight, it has been necessary to be at to secure the proper means of expelling water from the mines, quarries, etc. With this Pump an immense saving is effected in both instances, as in first cost it is much less than other Pumps of the same capacity and power.

Its principle is that of a Double-acting Force Pump, with a heavy double-acting piston cast in one piece, and a double-acting iron valve within the same, without the use of leather valves or any packing whatever.

RECOMMENDATIONS.

Office of the American Ship Building Company, New York, Oct. 21, 1864.

I am very much pleased with the economy and simplicity of the American Pump, which I have examined with much interest. IT IS ADMIRABLY ADAPTED FOR SHIP PURPOSES, and from its GREAT POWER would do incalculable service in the event of LEAKAGE. It also works well in pumping, where the cargo consists of grain in bulk, and is free in its action.

AUGUSTUS WALKER, Marine Constructor.

New York, October 26, 1864.

To the American Pump Manufacturing Co.:

I have examined with much interest the working and results of the Double Action Force Pump which you are introducing in the market. For use as a Ship Pump and for Mining purposes, I consider it of great value, the results far exceeding anything of the kind presented to my observation, particularly for its GREAT POWER and SIMPLICITY. It will give me pleasure to recommend its introduction into the Navy. Please deliver as soon as possible the Pumps ordered by me last week, for the Mines of the Middlefield Fire and Building Stone Company of Massachusetts, and oblige, Yours, respectfully, CHARLES B. STUART, Consulting Engineer, U. S. N.

Office of the Neptune Iron Works, New York, February 6, 1865.

the American Pump Manufacturing Co.:

I was very much impressed in examining the Pump manufactured by your Company. The originality of the design is in good keeping with its simplicity of construction—certainly very desirable qualities in all mechanical combinations. The extensive demand is the best proof of the popularity and favor it is receiving from the public. I have no hesitancy in recommending it to the inspection of those wishing THE BEST PUMP in the country.

CHARLES HUBBARD, Jr.,
Superintendent.

Office of Donald McKay,
East Boston, Aug. 15, 1865.

Alvin Walker, Esq., Sec. American Submerged Pump Co

DEAR SIR:—In answer to your request for my opinion of your Patent Submerged Pump, will say, that for simplicity, compactness and durability, it has the appearance of being the BEST mechanical combination I have seen, having fitness combined with its simplicity, making it SUPERIOR to Pumps now generally used for general purposes on land. Also, well suited as a Ship Deck Pump, and, in my opinion, can be arranged to be readily used as a good Bilge Pump for Ships.

Yours truly,
HIRMAN WINTER

CAMP PAROLE, ANNAPOLIS, Md., April 22, 1865.

Wm. Numson, Esq., President, Baltimore:

DEAR SIR,—The No. 2 Pump has been properly adjusted, and works to our entire satisfaction Hoping you may be successful in introducing it to the public, we remain,

Very respectfully, yours, &c.,
JONES & CROWLEY.

(Letter from the President of Board of Common Council, City of Boston)

Boston, August 10, 1865.

A. Walker, Esq., Sec. American Submerged Pump Co.—

Dear Sir—In reply to your request for the results of the trial of one of your Pumps, I will briefly state the purpose for which it was needed, and the complete satisfaction attained. It was desired to clean out a well 42 feet in depth, in which there stood 10 feet of water; I had previously vainly tried several methods, in one of which one large Force Pump and as many buckets as could be used, succeeded in 10 hours in reducing the depth of the water to 9 feet, but beyond that nothing could be gained. I then put in one of your smallest Pumps, which drained the well completely in SIX HOURS: although the spring which fed the well yielded a stream of water about as large as a man's arm. I need not say that I consider the Pump fully capable of accomplishing what you claim for it. Yours truly, W. B FOWLE.

I can fully en[illegible] C. C. LINCOLN